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ETHNIC FERTILITY DIFFERENTIALS IN PENINSULAR MALAYSIA:
THE IMPACT OF GOVERNMENT POLICIES

By
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ABSTRACT

ETHNIC FERTILITY DIFFERENTIALS IN PENINSULAR MALAYSIA: THE IMPACT OF GOVERNMENT POLICIES

By

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While the Total Fertility Rate (TFR) for Peninsular Malaysia began falling in the late 1950s, it did not do so uniformly for all three main ethnic groups. While the TFR for Chinese and Indians has steadily declined, it levelled off for Malays from the late 1970s, creating an increasing gap between Malay and nonMalay fertility. Previous studies on ethnic fertility differentials in Peninsular Malaysia have for the most part concluded that these differences are due to socioeconomic and demographic differences, thus lending support to the characteristics hypothesis. Although more recent research has alluded to the importance of political, religious and institutional elements as important explanatory variables, they have not attempted to measure their impact on fertility behavior directly. This research examined the impact of government policies, specifically the New Economic Policy (NEP) and the New Population Policy (NPP), on ethnic fertility differences.

Using data from the two Malaysian Family Life Surveys conducted in 1976 and 1988, logistic and multiple regressions were employed to gauge the impact of ethnicity and policies on desired fertility, while controlling for socioeconomic and demographic differences. This data provided the observation of

changes in the social, political and demographic factors over a span of time from before the implementation of the NEP, in 1971, to after the introduction of the NPP, in 1982.

It was found that ethnic differences in desired fertility persisted, in both urban and rural areas, even when controlling for socioeconomic and demographic differences, in line with the minority group status hypothesis. This research concluded that the benefits accruing to the politically dominant Malays from the NEP - an ethnic specific policy targeted at uplifting the socioeconomic status of Malays - encouraged them to respond pronatalistically to the government sponsored NPP. This response was strong enough to offset fertility declines accompanying socioeconomic and demographic changes. Alternatively, the presence of the NEP, exacerbated minority insecurities and encouraged antinatalism among Chinese and Indians and left them less motivated to seize the benefits of the NPP. The combination of these two policies could explain the diverging Malay-nonMalay fertility trend.

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Dedicated to my parents:
Who taught me to reach for the skies
So I may fall on the treetop

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CHAPTER I

INTRODUCTION

I begin this research by posing two questions: Firstly, how do government policies designed to benefit a particular ethnic group affect the demographic composition of the population? Secondly, how do minority groups respond demographically to national government policies? Peninsular Malaysia¹ offers an ideal ground to explore these questions. Three distinct ethnic groups compose the 14 million people of Peninsular Malaysia: the Malays (58%)²; the Chinese (32%)³; and the Indians (10%)⁴ (Malaysia, 1988:5).⁵

¹The East Malaysian states of Sabah and Sarawak are excluded because their ethnic composition varies from that of Peninsular Malaysia.

²Includes Malays, Indonesians, and other indigenous peoples of Peninsular Malaysia, commonly known as 'Orang Asli' (Original People). Official statistics do not provide a detailed breakdown for these three groups, but various authors have indicated the Malay population for Peninsular Malaysia to be around 50 percent (Ackerman and Lee, 1988; Clad, 1989; Weeks, 1988).

³Refers to people from Mainland China, Hong Kong, Singapore, Taiwan, and others of Oriental descent.

⁴Refers to people from the Indian sub-continent, including those from Pakistan, Bangladesh, and Sri Lanka.

⁵This categorization excludes a negligible 0.6% classified under 'Others', who include Thais, other Asians, Europeans, and Eurasians.

Since its Independence in 1957, social and economic development has proceeded at an unprecedented pace in Malaysia, placing the country in the forefront among the world's developing nations. Today it is the world's leading exporter of palm oil, rubber and microchips. Real growth in the per capita gross domestic product over the 1970s and 1980s averaged 7 percent while the per capita gross national product stood at US\$1865 in 1988 (Malaysia, 1988:v). Equally important strides were made in the spread of modern medical sciences, transportation and communication throughout the country. For example, about 75 percent of women in the age-group 15-19 attended secondary school in 1980, whereas one generation ago (that is, those aged 35-39 in 1980), only 15 percent were able to reach secondary school (Malaysia, 1983, Vol.II:508). The infant mortality rate in Peninsular Malaysia which was 102 per thousand in 1947, declined to 14.6 in 1988. The life expectancy at birth in 1988 for males and females was 69.1 and 73.3 years, respectively. It is against this background of rapid socioeconomic growth that the context of Peninsular Malaysia's fertility trends must be examined.

After the post-war Baby Boom, the national fertility rate in Peninsular Malaysia began falling in the late 1950s but not uniformly for the three main ethnic groups. While the Total Fertility Rate (TFR) for Chinese and Indians has been steadily declining, the TFR for Malays levelled off around the late 1970s (refer Table 1). There was a shift in the relative

Table 1
Total Fertility Rates For Peninsular Malaysia By Ethnicity

Year	P. Malaysia	Malays	Chinese	Indians	Malays=100	
					Chinese	Indians
1947	5.99	5.14	7.22	6.99	140	136
1957	6.56	6.08	7.22	7.66	119	126
1958	6.28	5.91	6.72	7.38	114	125
1959	6.77	5.82	6.53	7.51	112	129
1960	6.04	5.74	6.34	7.27	110	127
1961	6.18	5.99	6.35	7.42	106	124
1962	6.04	5.82	6.24	7.22	107	124
1963	5.97	5.86	5.99	7.01	102	120
1964	5.98	5.99	5.81	6.95	97	116
1965	5.64	5.54	5.64	6.71	102	121
1966	5.72	5.90	5.43	6.34	92	107
1967	5.41	5.45	5.23	6.18	96	113
1968	5.40	5.63	5.02	5.73	89	102
1969	5.06	5.36	4.67	5.31	87	99
1970	4.88	5.09	4.62	4.96	91	97
1971	4.91	5.18	4.66	4.65	90	90
1972	4.70	4.99	4.37	4.45	88	89
1973	4.43	4.73	4.07	4.13	86	87
1974	4.37	4.74	3.91	4.14	82	87
1975	4.20	4.64	3.63	3.91	78	84
1976	4.18	4.42	3.91	3.71	88	84
1977	4.02	4.50	3.41	3.58	76	80
1978	3.87	4.27	3.37	3.45	79	81
1979	3.90	4.38	3.28	3.44	75	79
1980	3.25	4.47	3.13	3.37	70	75
1981	3.92	4.60	3.05	3.31	66	72
1982	3.85	4.57	2.96	3.17	65	69
1983	3.73	4.53	2.72	3.00	60	66
1984	3.81	4.67	2.73	2.96	58	63
1985	3.89	4.84	2.69	2.90	56	60
1986	3.73	4.74	2.36	2.95	50	62
1987	3.55	4.51	2.25	2.77	50	61

Source: Saw, 1990:102,104.

position of Malay fertility vis-a-vis non-Malay fertility. Of the three main ethnic groups, Malays experienced the lowest TFR until 1957, after which their position relative to the Chinese was reversed, and has been maintained right up to 1987. A similar shift in the relative positions of Malay and Indian fertility took place in 1969. Since then Malay TFR has continued to exceed non-Malay TFR. By 1987, the Malay level of fertility was 100 percent higher than that of the Chinese and 63 percent higher than that of the Indians. Since ethnic differentials in mortality rates were not large enough to offset the ethnic differences in fertility, the Malay percentage of the total population in Peninsular Malaysia has increased from 49.5 percent in 1947 to 58 percent in 1988 (refer to Table 2). In contrast the Chinese and Indian populations have declined from 38.4 percent and 10.8 percent in 1947 to 32 percent and 10 percent in 1988, respectively (Saw, 1990). Such uneven changes have meant that the gap between Malay and non-Malay population growth rates steadily widened since the mid seventies (refer to Figure 1). The Malays are demographically in the majority. They are also dominant politically. The Chinese, albeit a minority in numbers, are economically dominant. The Indians have neither political nor economic power as a group and are demographically a minority. Given this delicate balance

Figure 1
Total Fertility Rate of Peninsular Malaysia by Ethnic Group

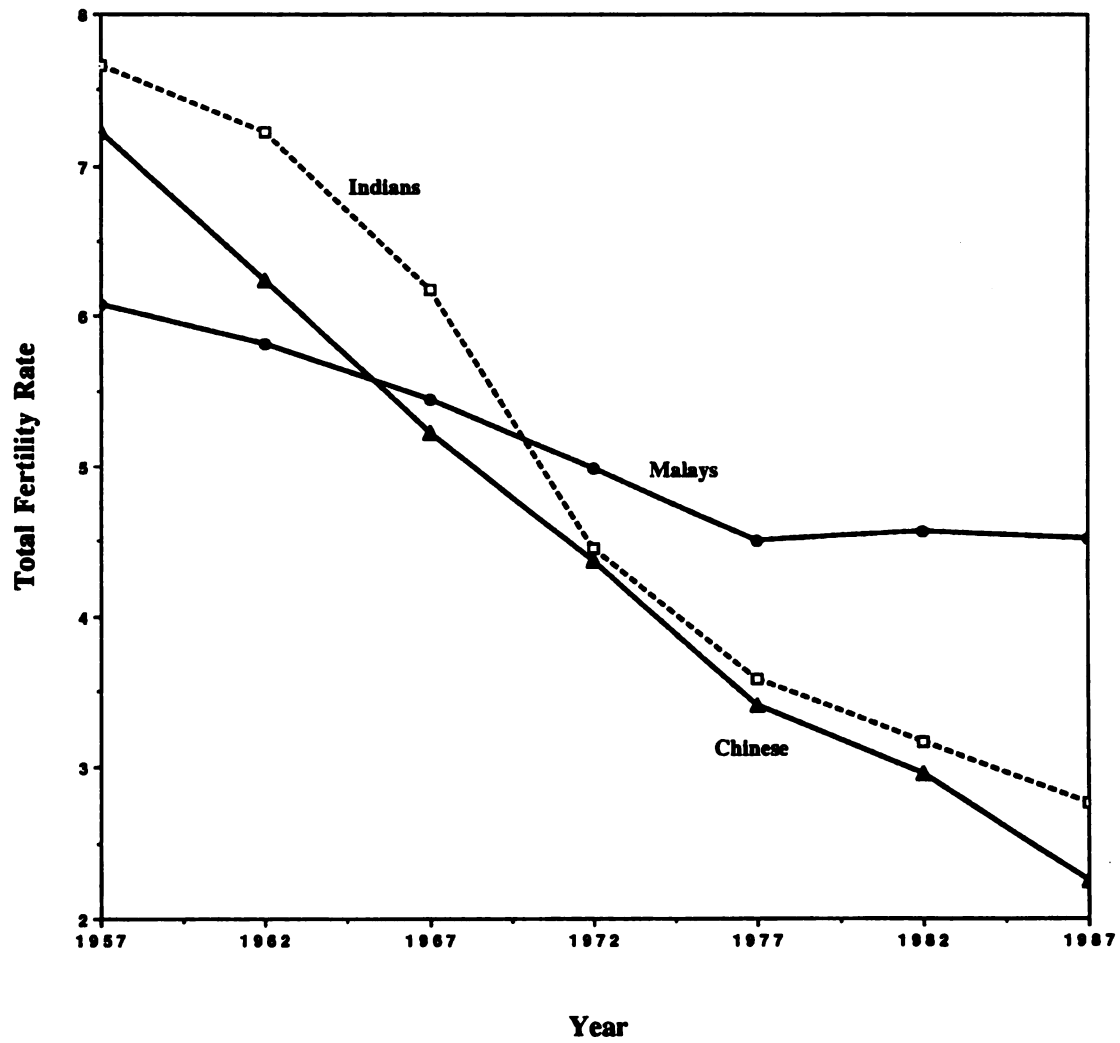


Table 2
Population Distribution Of Peninsular Malaysia

Year	Malays		Chinese		Indians		Others		Total	
	Numbera	%	Numbera	%	Numbera	%	Numbera	%	Numbera	%
1947	2.43	49.5	1.88	38.3	0.53	10.8	0.07	1.4	4.91	100
1957	3.13	49.8	2.33	37.1	0.74	11.8	0.08	1.3	6.28	100
1970	4.66	53.1	3.12	35.5	0.93	10.6	0.07	0.8	8.78	100
1980	6.13	56.0	3.65	33.4	1.09	10.0	0.07	0.6	10.94	100
1988b	8.05	57.7	4.43	31.7	1.39	10.0	0.09	0.6	13.96	100

a In millions

Source: Ad-Hoc Committee on Population Issues, 1983:Appendix 1:5.

b Malaysia;1988:5.

between the Malay and non-Malay populations, any difference in the levels of reproduction will have important social and political consequences in the future proportional representation of the minority Chinese and Indians, with important implications for their future security.

What are the causes of such marked ethnic differentials in fertility? Some researchers have suggested that the New Economic Policy (NEP), implemented in 1971 in response to the 1969 race riots, may have affected the above-noted demographic trends (Hirschman, 1986) by giving economic benefits to Malays. Others have interpreted the levelling and subsequent rise in Malay fertility as a response to the Government's pronatalist New Population Policy (NPP), introduced in 1982 and targeted at reaching a total population of 70 million by the year 2100 (Jones, 1985).

Research Objectives

This research will address two sets of related questions. Firstly, why have Chinese and Indian fertility rates fallen below those of Malays? Secondly, how has the New Economic Policy (NEP) and the New Population Policy (NPP) affected differences in fertility desires between Malays, Chinese, and Indians?

Early studies carried out on fertility differentials in Peninsular Malaysia have for the most part concluded that ethnic differences are highly correlated with differences in socioeconomic status and demographic characteristics, thus lending support to the 'characteristics' or 'assimilation' hypothesis (Saw, 1967; Palmore and Marzuki, 1967; Lee et al, 1968; DaVanzo and Haaga, 1982; Tey and Idris, 1981). The Characteristics Hypothesis holds that differences in fertility among racial groups are due only to differences in their social, economic, and demographic characteristics. For example, Chinese and Indian women in Peninsular Malaysia are more prone than Malays to live in urban areas, to marry late, and to finish more years of school (Arshat et al, 1988); and these three characteristics are related to lower birth rates. If the characteristics hypothesis is true, then when such differences in residence, age at marriage, and female education have been rendered equal by statistical control or social change, the differences in fertility rates among Chinese, Indians, and Malays should no longer exist. On the

contrary, Goldscheider and Uhlenberg (1969) argued that if minority group members aspire to, or reach, a high degree of socioeconomic mobility despite structural barriers against them, they will usually marshal resources for it by delaying or limiting childbirth. Such an antinatalist strategy for upward mobility will be most likely if the minority group lacks a normative system placing a premium on childbirth and discouraging the use of efficient contraceptives (as is the case for Chinese and Indians in Peninsular Malaysia). An implication is that when socioeconomic differences between the ethnic minority and majority disappeared through statistical control or social change, the differences in fertility rates should nevertheless persist. The question that arises then is: Do ethnic differentials in fertility persist even if socioeconomic factors influencing fertility in Malaysia are rendered equal?

The NEP introduced political and economic changes which have affected the avenues for upward mobility in Malaysia differently for the three ethnic groups. Following the 1969 ethnic riots, the Government introduced the NEP, to be implemented over a 20-year period from 1971-1990. The implementation of the NEP entailed a new role for the Government from that of providing basic infrastructural facilities to direct intervention in the economy to safeguard the interests of Malays, who were at that time economically the most backward of the three main ethnic groups. This policy

set quotas for college and university admission, educational scholarships, and new entrants in the civil service and private sector, all of which were aimed at the socioeconomic advancement of Malays. In an environment of limited resources, an inevitable consequence was the relative deprivation of Chinese and Indians. I reason that since the NEP created avenues for upward mobility exclusively for Malays, the relative deprivation faced by Chinese and Indians must have raised their antinatalism. Thus, the ethnic disparity in fertility should have grown larger after 1971. This argument is consonant with the arrested decline in TFRs for Malays in the mid-1970s in face of the continuing decline for the others.

In September 1982, the Malaysian Prime Minister surprised many when he openly expressed the economic advantages of a larger population base, and indicated that given the country's resources, it could support a population of 70 million, or about five times the size of the 1982 population. Following his announcement, an Ad-hoc Committee on Population Issues was set up in January 1983, which recommended that the existing fertility decline be slowed down to reach the targeted size of 70 million in 115 years, that is, by the year 2100. Specifically the committee recommended that the TFR be reduced by about 0.1 point every five years from 1985, to achieve replacement level fertility by about 2070. This target was reaffirmed in 1984 when it was incorporated as the New

Population Policy (NPP) into the mid-term review of the Fourth Malaysia Plan (Cheung, 1989). Several measures, which can be construed as pronatalist, were introduced in 1984 to slow down the fertility decline. A five-child family norm was encouraged when the Prime Minister encouraged parents to 'go for five', in public speeches. In support of this, maternity benefits, previously limited to the first three children, were extended to the fifth child. Child relief allowances for tax purposes were revised to allow greater deductions for every subsequent child, up to the fifth child, from the previous downward scale (Jones, 1985). The Family Planning Act was amended to become the Population and Family Development Act. In line with this the National Family Planning Board was renamed the National Population and Family Development Board to reflect an emphasis on family welfare and development rather than family planning.

I hypothesize that although the NPP was not targeted at any specific ethnic group, the guarantees to subsidized education and labor force participation to Malays from the NEP better equipped them to avail of the pronatalist benefits of the NPP. Similarly, the relatively greater barriers to upward mobility erected against Chinese and Indians by the NEP were likely to encourage antinatalism among these minorities and to leave them less motivated to seize the benefits offered by the NPP.

Accordingly, I hypothesize that everything else being the same, the Malay-nonMalay difference in desired family size

will be greater in 1988 than in 1976, with Malays expressing a desire to have more children than Chinese or Indians, since Malays are more likely to have revised their expectation upwards, under the influence of the NEP and NPP, while non-Malays are more likely to have revised their expectation downwards, under the influence of the NEP, and not reacted to the NPP. This argument is consistent with the rise in Malay TFR in the wake of continuing decline in non-Malay TFRs in the 1980s.

This hypothesis is tested using data collected in the two Malaysian Family Life Surveys, MFLS-1 and MFLS-2, by the RAND Corporation and Malaysian collaborators. These surveys contain rich micro-level data, which spans over the last five decades, covering the dramatic socioeconomic and political changes that have occurred in Peninsular Malaysia from before Independence in 1957 to after the implementation of the NEP and NPP.

These two surveys are well-suited for my analysis. MFLS-1 was conducted in 1976, five years after the implementation of the NEP, with enough time for changes in fertility desires to emerge. It will therefore be used to assess the immediate impact of the NEP. MFLS-2 was conducted in 1988, six years after the first mention of the NPP and four years after its tax and maternity benefits were implemented. Hence, it provides the opportunity to assess the impact of the NPP. To the extent that it takes time to change people's reproductive

behavior, 1988 should also provide a good indicator of the long-term impact of the NEP.

Organization of Study

The study begins with a review of the literature in an attempt to develop a theoretical framework for investigating ethnic differentials in fertility. The aim of chapter II is to discuss the debate on the minority group status effect, which has centered mainly in North America, and to identify studies of ethnic differentials in fertility within Asia. This is then followed by a critical assessment of studies on fertility differentials in Peninsular Malaysia.

Chapter III is a historical overview and description of the conditions that have given rise to the present ethnic matrix in Malaysia. In this chapter, I discuss the importance of ethnicity within this context, and attempt at delineating a socially meaningful definition of minority group. A core part of this chapter is a discussion of the presence of barriers to upward social mobility and the feelings of insecurity by the minority Chinese and Indians.

Chapter IV lays down the conceptual framework for analysis and describes the research design that will guide this study. It also incorporates a description of the two Malaysian Family Life Surveys, and its appropriateness for this research. Also discussed is the source of this data, the

survey instruments, the purpose of the surveys, and the quality of the data.

Chapter V introduces the research hypotheses that will be tested in this study, followed by a brief description of the derivation of the sample sets used in this research. This chapter also includes a discussion of the measurement of key variables and a description of the methodology employed in testing the research hypotheses.

The main purpose of Chapter VI is to present the findings of the research and to discuss them in light of the hypotheses tested.

I conclude this study in Chapter VII, by discussing the policy implications of the research and its contribution to future studies on ethnic fertility differentials.

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CHAPTER II

REVIEW OF LITERATURE

The dominant paradigm from which explanations of fertility decline have emerged is the demographic transition theory, which provides a perspective for classifying a broad sequence of events. Its central tenet is an emphasis on social and economic change, which leads to an initial decline in mortality, followed by an ultimate decline in fertility (Coale, 1973). The dissatisfaction over the failure of demographic transition theory to fully account for fertility decline, has given rise to a wealth of theories purporting to explain the demographic behavior of a country or cluster of countries, whose fertility patterns did not follow the path laid down by such traditional demographers as Notestein and Davis (Freedman, 1979).

Economic theories of fertility, notably Becker (1960), Willis (1974), and Schultz's (1985) conceptualization of the quantity-quality tradeoff in parental decisionmaking, have risen in popularity, especially in the wake of rising levels of female education, and increased female participation in a work environment quite separate from the traditional household. They suggested that changing family sizes result

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from changes in parental earnings and in the cost of children, stemming from changes in the cost of living and in the pattern of investments in children. According to them, increases in the investments in children, that is, the price of children, is the cause of declines in family size observed in the later stages of economic development. However, these theories have been criticized for their economic determinism and failure to recognize the importance of cultural and institutional factors in fertility decisionmaking.

An innovative addition to explanations of fertility decline is diffusion theory, which stresses the importance of social and economic factors, but within a matrix of cultural and institutional influences (Freedman, 1979). Caldwell (1976), for example, in invoking the intergenerational wealth flow theory, suggested that a reduction in family sizes will occur when children shift from being a net asset to a net financial cost to parents. This according to him, would come about with 'westernization' which is accompanied by an emphasis on education, and modern values, that removes children from being an important source of family labor. Another series of studies have shown the importance of the changing roles and earnings of women, their increased opportunity to work, and changes in their occupational setting in determining family size (for example, Butz and Ward, 1979; Schultz, 1985).

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An important emphasis of population studies for the past three decades has been on the social patterns of pronatalism or antinatalism that set racial, religious, or ethnic minorities apart from the majority group. A global trend towards fertility decline has led to emphasis on ways that membership in a minority group motivates antinatalist reproductive behavior that would suggest a fertility decline in the minority group.

Research in this area can broadly be classified into two approaches. One type of analytical approach attributes variation in racial-ethnic fertility to differences in socioeconomic characteristics. This hypothesis has variously been referred to as the 'social characteristics' or 'characteristics' or 'assimilationist' hypothesis (Goldscheider and Uhlenberg, 1969; Bean and Marcum, 1978; Frisbie and Bean, 1978). According to this hypothesis, when differences in social, demographic, and economic characteristics have been rendered equal by statistical control or social change, fertility differentials will cease to exist or converge to the point of insignificance. The second approach, which has come to be known as the minority group status hypothesis, postulates that even when socioeconomic differences converge, fertility will continue to be different for different racial-ethnic minorities (Goldscheider and Uhlenberg, 1969; Sly, 1970). This difference is attributed to the independent effect of 'insecurities'

which arise when the minority group fails to assimilate completely in all dimensions of the social, economic and political spheres. To counteract this feeling, minorities might defer or limit their family size in an attempt to solidify their socioeconomic position. The theoretical grounding for the current research is based on this latter proposition.

The pioneering work of Goldscheider and Uhlenberg (1969), provides an insightful starting block. They contrasted fertility rates for three pairs of groups: urban, college-educated white and nonwhite ever-married women in the 1960 U.S. Census; urban native white and Japanese ever-married women in the same census; and urban Protestant and Jewish ever-married women in the 1961 Census of Canada. In all three contrasting pairs of North American women, the minority -- the second mentioned group -- had much lower cumulative fertility rates than did the majority -- the first mentioned group. From their observation of this regularity, Goldscheider and Uhlenberg inferred the following conditions which might elicit antinatalism among the minority group:

- the desire for, and the attainment of, acculturation by the minority group;
- the experience of, or at least the desire for, upward socioeconomic mobility by the minority group; and
- the absence of pronatalist ideology inhibiting usage of artificial contraception by the minority group.

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Under these conditions, the tension between the minority group's acceptance of norms justifying its efforts to move up legitimate socioeconomic ladders and the barriers raised against such attempts by the majority group was hypothesized to exact more sacrifices from the minority group, including the later timing, and limit on the number of births.

Thus the minority group status hypothesis contends that minorities who are disadvantaged in economic, social and/or political arenas deliberately control the number or the timing of their births so as to save resources for upward mobility. Research on this hypothesis has centered mainly on the urbanized minorities in the more highly developed countries since it is within such geographic areas that the prospect for upward mobility and the prevalence of contraception have been greatest for both minorities and majorities (Sly, 1970; Roberts and Lee, 1974; Ritchey, 1975; Jiobu and Marshall, 1977; Lopez and Sabagh, 1978; Johnson, 1979; Johnson and Nishida, 1980; Trovato and Burch, 1980; Halli, 1987).

The literature review that follows, though not exhaustive, reflects the more important research efforts in this area. It begins with a critical analysis of work done mostly in North America, followed by a review of two prominent pieces of research carried out in Europe (Van Heek, 1956; Kennedy, 1973). Much of the research on fertility differentials in developing countries focus on religious differences, are predominantly descriptive and not directly

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concerned with the minority group status effect. Some important exceptions are discussed (Chamie, 1981; Johnson and Burton, 1987; Kollehlon, 1989). This is followed by a critical assessment of the literature reviewed, with an eye to pointing out how the current research differs from previous research. Finally, I review the various research carried out on fertility differentials in Peninsular Malaysia, most important of which is Tan's (1981) test of the minority group status hypothesis, and a more recent multinational study carried out by Noor Laily et al. (1985).

Literature Review

Research on the minority group status hypothesis has for the most part been concentrated in North America. Goldscheider and Uhlenberg's proposition was first directly tested by Sly in 1970, when he compared white and non-white fertility using the 1960 U.S. census data. He reported that while the use of simple descriptive statistics supports the minority group status hypothesis, the employment of a more rigorous inductive analysis of variance technique to test the interaction of race with education, income and occupation revealed that fertility differentials between the two groups became primarily a function of the characteristics hypothesis. From this he concludes that the relationship between minority group status and fertility does not operate when applied to black-white fertility differences, and suggests a reformulation of the

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hypothesis to take into account the extent of structural assimilation.

In a study of current and cumulative fertility among three classifications -- white-non-white, minority-majority, and Spanish-other-black -- Roberts and Lee (1974) questioned the research of Goldscheider and Uhlenberg, and Sly on several grounds. Firstly, they contend that both papers stress cumulative fertility and ignore the more important examination of current fertility. Secondly, they argue that neither papers control for the two factors that exert an influence on fertility -- employment status and the age of the woman at the time of first marriage. Finally, both papers are criticized for failing to define and measure the concept of minority group status, in the 'sociological sense of the word' (p.504). In their reexamination of the two questions: what is the effect of minority group status on fertility; and which serves to better explain majority-minority group fertility differences -- the assimilationist or the minority group status effects, they support Goldscheider and Uhlenberg's position that ethnicity exerts an independent effect on fertility, and reassert the need to incorporate social and psychological factors in studies to determine the independent effect of ethnicity on fertility.

In a contextual approach to the study of blacks and whites in the U.S., Ritchey (1975) investigated racial inequality in the state of residence as it might affect

reproductive behavior. Using the 1970 U.S. census data, he examined the effects of individual level variables such as, race, education, age, and employment status. Racial inequality was determined by an index of 10 factors drawn from various sources to measure socioeconomic inequality between the two groups, as well as the degree of racial segregation and discrimination. Ritchey found partial support for the minority group status hypothesis in his study of black-white fertility differentials. His conclusion suggests that while the minority group status hypothesis is relevant for the understanding of current fertility differentials, blacks and whites could be expected to have similar fertility, at some future point, because as racial inequality decreased, so too the magnitude of the minority group status effect.

In an effort to shed additional light on the validity of the assimilation and minority group status hypotheses, Jiobu and Marshall (1977) carried out a comparative study of Chinese, Japanese, Filipino Americans and native whites' family size, utilizing the 1970 public use samples for Hawaii and California. Their study revealed that while minority group status did influence family size, it did not always reduce fertility. They contended that inter-group differences in values and behavior persist even when socioeconomic status is equalized, thus suggesting that fertility differentials should be considered not only as resulting from the interaction between structural and cultural assimilation, but also from

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the historical and traditional patterns of specific groups.

In their study of Los Angeles Chicanos, Lopez and Sabagh (1978) dealt with the above controversy, by decomposing the minority group status effect into two dimensions - normative and structural. Their results show that while ethnicity and socioeconomic measures were generally negatively correlated, the correlation between ethnicity and fertility was weak and positive. They further distinguished between 'social', 'media', and 'context' ethnicity and argued that any measure of ethnicity, as a distinct dimension, must be uncontaminated by indications of low status or other general traits associated with having large families. They contended that having mostly other Chicano friends and using Spanish at home ('social' ethnicity), watching and listening to Spanish television and radio ('media' ethnicity) and living and working in a predominantly Spanish neighborhood ('context' ethnicity), were the best indicators of sociocultural ethnic integration. They concluded that the high fertility among the Chicanos could be interpreted as support for the effects of structural forces such as discrimination and resource deprivation, and not as a result of subcultural values.

In a similar vein, Trovato and Burch (1980), in their study of selected ethnic group fertility differences in Canada, argued that structural and subcultural effects were not mutually exclusive and hence must be measured directly and separately in order not to confound the empirically observed

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total effects. They suggested that in reality, subcultural norms alone or in conjunction with structural effects may account for an ethnic effect on family size.

Johnson (1979) examined the minority group status hypothesis for black and white women using the 1970 National Fertility Study of the U.S. and posited four interactive relationships between race and education on fertility. According to her, the strong form of the characteristics hypothesis holds when race retains no net relationship to family size at any level of education, once the compositional differences between blacks and whites have been statistically controlled. In contrast, the weak form of the characteristics hypothesis holds when statistical control of compositional differences removes the effect of race on fertility for the highly educated but not for the less educated. Similarly, she argued that the strong form of the minority group status hypothesis implies a net direct effect of race on fertility at every level of education, while a weak form of the minority group status hypothesis predicts a link between race and fertility only for those who have sought and achieved upward mobility. She found no support for the minority group status hypothesis that highly educated blacks would demonstrate lower fertility than highly educated whites due to social constraints. However, her findings support the weak form of the characteristics hypothesis.

Together with Nishida, Johnson (1980), went on to test

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this theory of fertility for the Japanese and Chinese in Hawaii and California, using the 1970 state census data. Their rationale was that these two states provide 'a natural experiment for testing the minority group status hypothesis of fertility' (p.497), because the absence of any racial majority in Hawaii suggests that minority group status cannot explain racial differentials for the state, in contrast to California where the Japanese and the Chinese are in the minority. They attributed most of the explained variance to socioeconomic and demographic factors.

Halli (1987) addresses this debate by examining the fertility rate of the Asian groups in Canada. He questions previous research as having unduly focussed on socioeconomic factors to explain observed variations in fertility between majority and minority population groups, and attributing the residual variances to the minority group status effect. In his examination of fertility differences between the Chinese and Japanese minorities in Canada as against the British majority, he incorporates a historical analysis and traces the inequality of treatment and discrimination faced by minorities in such areas as employment. In an attempt to revise the original theory, Halli introduces new concepts such as 'ascribed' minority group status versus 'perceived' minority group status. By employing two types of multiple regression analyses -- additive and interactive models -- he contends that while the former analysis leads to the conclusion that

there exists an independent minority group status effect on the fertility of the Chinese and Japanese women, its relative strength is discernible only with the latter technique, the Chinese experiencing a stronger effect than the Japanese.

There has been a scattering of research on the effect of minority group membership outside of North America. One of the earliest known studies of differential fertility is that of Van Heek's (1956), who was interested in investigating the reason for the slower fall in Dutch Catholic fertility as compared with other Dutch groups and Catholics in other countries. He emphasized that the relative size of the minority can be politically important, and that a pressure for higher minority fertility then, is a belief by the members of the group that their political influence will increase as their proportion of the total population rises.

Following in the tradition of Van Heek, Kennedy (1973) attempts to compare the same group under different conditions -- when they are a majority as in the case of Catholics in the Republic of Ireland, and when they are a minority as in the case of Catholics in Northern Ireland. He suggests that minority group status can exert an independent pronatalist influence on fertility when the minority is relatively large, is politically important, is economically disadvantaged, and the cohesiveness of the minority is strong, as in the case of Northern Ireland. However, even in the presence of such conditions, minority group status is a less important

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determinant than such factors as religion, rural/urban status or the selective impact of migration.

While numerous efforts have been made to test minority group status effects on the fertility rates in developed countries, especially in North America, and to a lesser extent in Europe, there has been a dearth of such research in developing countries. Most of the research on minority group fertility patterns have either been largely descriptive or not explicitly concerned with interpreting observed fertility differentials between racial-ethnic groups in terms of the minority group status hypothesis. The bulk of the literature focuses on fertility differentials on the basis of religious differences (for examples, see: Busia, 1954; Taeuber, 1955; Yaukey, 1961; Driver, 1963; Rizk, 1963; 1970; Balasubramanian, 1984; Weeks, 1988). However a few of the more relevant exceptions are reviewed below.

Few tests of the minority group status hypothesis are available from Africa. A recently published study used the 1974 Census of Liberia to examine interethnic variation by comparing five ethnic minorities -- Bassa, Vai, Grebo, Kru, and Kpelle -- with the majority, Americo-Liberian. The author (Kollehlon, 1989) rejected numerical size as a measure of minority group status and designated minority group status to those groups which held a disproportionately smaller share of the social, economic, and political power of the nation. The Americo-Liberian women displayed a much lower average number

of children ever born, but they were more likely to be never-married, to have reached primary or secondary school, to be paid employees, and to reside in urban areas. After the effects of these latter factors on fertility had been controlled, there were no net differences in fertility remaining among five of the six ethnic groups. Kollehlon concluded that with the possible exception of the Bassa, who had substantially lower net fertility than the Americo-Liberians (2.7 and 3.0 children ever born, respectively) the minority group status hypothesis had been rejected.

The opposite conclusion was reached in Johnson and Burton's (1987) direct test of the minority group status hypothesis in the Philippines. They assigned majority group status to Roman Catholics who accounted for 83% of the population and were politically advantaged by the union of Church and State, while the lack of numerical and political strength qualified Protestants as a minority group. From a survey of 366 unmarried college students, Johnson and Burton found that Catholics in general wanted more children than their Protestant counterparts, were more likely to say that contraception should be delayed until after the first wanted birth, and to think that diaphragms, IUDs, condoms, and surgical sterilizations were against divine will. The authors also found that, in the case of the Catholics, the number of children desired did not vary according to the type of college or university -- sectarian or secular -- therefore discounting

the possibility that greater pronatalism of the Roman Catholics flowed from their theology about contraception. This outcome suggested that integration into a religious institution might affect desired family size only if the religious group in question is a minority group. Furthermore, it pointed to the conclusion that antinatalism could be a response to the difficulties faced by an ambitious religious group limited by their status as a minority group in a developing country.

Chamie (1981) offered some insights into fertility differences in Lebanon, where religion is seen as the key dimension of social, economic, and political life. He argued that in a very underdeveloped country like Bangladesh, high mortality rates would require high fertility rates of all religious groups so that fertility behavior would not differ much among them. On the other hand, the advantages of life in an urbanized, highly educated country like the United States would blur religious differences in fertility. Therefore, he contended that it is only in an economically expanding society such as Lebanon where religious differences in reproductive behavior would appear. This would supposedly happen because the most highly educated women in any religious group would be in the forefront of economic development while the least educated women would be at the rear.

In Lebanon, Chamie found large Muslim-Christian differences among less educated women and small religious

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differences among more educated women in: number of children ever born per wife; number of children surviving per wife; proportions of women aware of coitus interruptus as a technique; and proportions of women currently or ever using contraception. He thus concluded that religious differences at the individual and the national level are primarily a function of economic differences and reasoned that those differences would converge at the elite end of the economic scale. Chamie's argument is consistent with the virtual absence of ethnic differences in fertility in Liberia (Kollehlon, 1989), the strength of Protestant-Catholic differences in reproductive attitudes in the Philippines (Johnson and Burton, 1987), and with the merger of black and white fertility reported for college-educated U.S. women (Johnson, 1979). However, it cannot explain the much lower fertility for Jews than Protestants in North America (Goldscheider and Uhlenberg, 1969).

Assessment of Previous Research

Goldscheider and Uhlenberg are to be credited for bringing to the fore the importance of minority group membership to fertility behavior. Their systematic formulation of the minority group status hypothesis has inspired an outpouring of research in this area and an emphasis on the link between minority group membership and fertility. This link is important in designing population policies, especially

those related to a reduction in fertility. An insight into whether fertility is affected by one's minority group membership, and if so, how, and under what conditions, is imperative for the successful planning and implementation of any population program.

While Goldscheider and Uhlenberg have been commended for introducing a descriptive richness into the area of demographic studies, they have also been severely criticized on other grounds. The fundamental weakness of their study is the failure to distinguish between two conflicting theories embodied in their minority group status approach - one that explains reduced minority fertility as a reaction to external structural pressures, sometimes referred to as the 'structural version' and the other that explains high minority fertility as resulting from subcultural norms and ideals, referred to as the 'subcultural version' (Bean, Swicegood and Marcum, 1983). Because of this conceptual ambiguity in the original theory, most subsequent studies have not spelt out *a priori* the research results that would support one or the other version of the minority group status hypothesis. An important exception is the work of Lopez and Sabagh (1978) who argued that a positive relationship in patterns of association between measures of ethnic integration and childbearing would support the subcultural version of higher minority group fertility. On the other hand, a negative relationship between the two measures would tend to favor the structural position,

since a greater ethnic integration would heighten the awareness of external discrimination.

This argument is also supported by Halli (1987), who criticizes the original theory for failing to treat the minority group status hypothesis as a single hypothesis, with alternative specifications. He argued that the characteristics hypothesis is just the null hypothesis and what is important is whether minority group membership has a net effect on fertility. He contended that psychological insecurities and the consequent constraints on family size, in order to mobilize resources to attain social mobility, is but one plausible minority group process, and that one can think of a variety of other post-hoc interpretations. As such each study comes up with a new explanation for the underlying causal variations in fertility. To overcome this inherent weakness in the original theory, he reconceptualized the minority group status influence on fertility to have two possible effects - structural and cultural. According to him, if structural factors are responsible then higher ethnic integration would lead minority members to limit their family size, however, when cultural factors are responsible, higher ethnic integration would lead to larger family size because of the greater adherence to the group's pronatalist norms, associated with the notion of group preservation and strength in numbers. He went on to add that for the social psychological interpretation to be convincing, it is necessary for these

attributes to be measured directly and modelled as intervening variables. He saw ethnic integration as strongly related to the perception of minority group status, as such he deemed it important to measure the ascribed and perceived minority group status, to analyze its influence on fertility. As he saw it, the problem with most studies is a reliance on data sources without measurements of the key theoretical variables.

Research on the minority group status effect has generally been beset by several problems. These can be classified under three broad headings: conceptual ambiguities, definitional problems, and methodological problems.

Ritchey (1975) saw Goldscheider and Uhlenberg's conceptualization of the minority group status hypothesis as weak and non-conclusive. He argued that the assumption of insecurity and marginalization felt by minorities was at best only applicable to the upper and middle class blacks in the U.S. and that it was not clear from their analysis what differences existed between majority and minority groups at lower socioeconomic levels, nor the direction these differences took.

This argument was elaborated by Bean and Marcum (1978). The approach taken by most studies presumes support for the characteristics hypothesis if racial-ethnic fertility differences disappear after controlling for socioeconomic variables. This approach assumes that there are no intra-racial or -ethnic variation in the way socioeconomic variables

are linked to fertility. When the possibilities of such interaction effects are considered, the outcome can be supportive or non-supportive of the minority group status hypothesis. Bean and Marcum identify these outcomes in terms of the 'effect difference' and 'levels difference' (p.202). They argue that the minority group status effect mentioned by Goldscheider and Uhlenberg refers to the effect difference, in which acculturation precedes socioeconomic assimilation, resulting in higher status members of minority groups resorting to exaggeratedly low fertility, in order to overcome the insecurities associated with membership in a minority group, and to sustain socioeconomic progress attained in the process of acculturation. The levels difference however does not presume the precedence of acculturation before socioeconomic assimilation, but in fact assumes that racial-ethnic fertility differences remain at all socioeconomic levels even after differences in socioeconomic status have been taken into account. However the implication is that minority insecurity increases the more socially and economically assimilated they are, and as such the minority group status effect would be more evident in some contexts than in others. My own contention in this research is that even while the minority is striving for structural assimilation, the independent effects of minority status may operate in either a rural or an urban setting.

Another bone of contention in this area of research relates to the definition of a minority group. As Roberts and Lee (1974) have demonstrated, different ways of operationalizing a minority group can render different conclusions. Moreover, according to Johnson (1979), the use of a white-non-white dichotomy to denote majority-minority relationship can be misleading as such a classification tends to overlook culture, physiogamy and other traits that identify racial-ethnic groups. The review of literature suggests the adoption of some minimum criteria for eligibility as a minority group. For some, minority group implies numerical subordination (Blalock, 1967; Browning, 1975), while for others it implies economical and political subordination (Kennedy, 1973). According to Peterson (1964), a minority group is characterized by a historical pattern of opposition from and discrimination by the dominant group, while for Wagley and Harris (1959), membership in a minority group is ascribed through a 'socially invented rule of descent' (p.7). Others like Schermerhorn (1978), define any ethnic group that 'forms less than half the population of a given society, with limited access to roles and activities central to the economic and political institutions of the society' as a minority group (p.16). The problem of defining a minority in the case of Peninsular Malaysia, is addressed in the next chapter.

Finally research in this area has been plagued by methodological problems. They have not always controlled for

the simultaneous effects of income, education, and occupation (Rindfuss, 1975; Ritchey, 1975) or taken into consideration the confounding effects of female education and labor force participation (Sly, 1970). The present research will test for the minority group status effect while controlling for rural and urban residence, age at interview, women's education and employment, and income.

Studies of Fertility Differentials in Malaysia

Early studies carried out on fertility differentials in Malaysia have for the most part concluded that ethnic differences are highly correlated with differences in socioeconomic status and demographic differences, thus lending support to the characteristics hypothesis. Discussed below are some of the more pertinent literature.

One of the earliest studies was carried out by Caldwell (1967), who analyzed all available data for the 1945-57 intercensal decade and found ethnic differences in fertility and evidence of differential decline. While Malay fertility was stable during the decade, Chinese and Indian fertility declined. He attributed this differential decline to a rural-urban difference and the uneven rise in the mean age of females at marriage.

Saw (1967) found a similar ethnic fertility pattern in the early post-war years up to 1957, and concluded that the average age at marriage and the age-specific marriage rates

were the two main factors that accounted for fertility differentials between the Malay majority and the Chinese and Indian minority. The marriage frequency below the age of 25 was another factor that accounted for this difference. However, he admits that the paucity of data made impossible, direct analysis of fertility differentials among income groups, educational levels, occupational or social classes. The indirect matching that was attempted, render his results non-conclusive.

In a study of fertility trends in West Malaysia, Lee, Palmore and Saunders (1968) concluded that rapid fertility decline was largely felt in metropolitan areas and was concentrated among the Chinese and the Indians and was primarily due to real changes in the fertility of married women, and a rapid shift in the proportion of women married in the youngest ages of the childbearing years.

Using data from the West Malaysian Family Survey, 1966-67, Palmore and Ariffin (1967) arrived at a similar conclusion. From a sample tested, they concluded that among women living in metropolitan areas or small towns⁶, 52% of the Indians and 42% of the Malays had some formal education. Among

⁶Palmore and Ariffin included stratification by size of place divided into:

- a) metropolitan areas - having a population of 75,000 or over;
- b) non-metropolitan areas - having a population between 7,660 - 74,999; and
- c) rural areas - having a population of less than 7,660; according to the 1957 National Census.

those in rural areas, Indians (29%) were almost twice as likely to have had some formal education than Malay women (16%). From the sample tested they also concluded that more educated women married later, and that urban women married later than rural women. Among currently married women, Malays married earlier than the Indians.

DaVanzo and Haaga (1982) analyzed the anatomy of fertility decline in Peninsular Malaysia using retrospective data from the 1976 Malaysian Family Life Survey. They found that at low parities there was little change in the intervals between births among Chinese and Malays, with intervals for Indians actually decreasing. At higher parities however, all three ethnic groups experienced lengthened pregnancy intervals. Moreover, the incidence and duration of breastfeeding declined among all three groups, with the decline for the Chinese being the greatest. However the increasing use of effective contraception, especially among the Chinese, more than offset the potential effects on fertility of reduced breastfeeding. They observed that the Malays who had the lowest total fertility rate in 1950 had the highest rate in 1975, because of minimal declines in their fertility levels. In contrast the Chinese who had adopted modern contraceptives more readily had achieved the lowest total fertility rate by 1975. The Indians who had the highest rate in 1950 experienced the sharpest decline over the period and ended up with the median rate. From their study DaVanzo

and Haaga concluded that the later age at marriage and the earlier cessation of family formation caused a fall in the total fertility rate for Chinese and Indians, to below that of Malays. These trends, while emphasizing the importance of such factors as breastfeeding and contraception on actual fertility, supported the characteristics hypothesis: that a convergence in overall lifetime fertility rates was underway for Chinese, Indians, and Malays in Peninsular Malaysia. ✓

In a more detailed study into contraceptive use, Tey and Idris (1981), used data from the Malaysian Fertility and Family Survey 1974, to ascertain the predictive power on contraceptive use of selected demographic, background⁷ and socioeconomic variables. Contraceptive use was shown to be associated with age, education, income, ethnicity and type of place of residence. They concluded that the use of ✓ contraception is most frequent among the more educated women, women with higher incomes and those living in urban areas. Among ethnic groups, the Chinese had the highest proportion, 60% of exposed women, using contraceptives, followed by Indians, 54%, and Malays, 30%. Although the percentage of exposed women using an effective method was much lower, in terms of ethnicity the ranking remained the same. Their study too reinforced support for the characteristics hypothesis. ✓

More recent research however has found some support for

⁷Background variables included type of place of residence, childhood place of residence, ethnicity, religion and family type.

the minority group status hypothesis. Hirschman (1986) discussed why the pace of fertility decline in Peninsular Malaysia had been slower for Malays than for Chinese and Indians. Namely, the Malays were hindmost in the demographic transition and last to experience a rise in: educational levels; opportunities for wage employment; and preferences for independent spouse selection. The rise in romantic marriages boosted the mean age at marriage and depressed the rate of marital dissolution. Thus, according to vital statistics on Malays for 1963-83, there was a drop in the age-specific fertility rates of first births to Malay women at ages 15-19 followed by a jump, especially at ages 25-29 in years 1973-83. These trends caused Malay women to postpone second births until ages 25-29 in 1973-78 and third births until ages 30-34 in 1978-83. The postponement of first, second, and third births until the 1973-83 decade made the rise in the Malay total fertility rate noticeable in the late 1970s. But because Malay women did not forego marriage and childbirth altogether, the rise in the Malay TFR was deemed to be only a short-term phenomenon associated with a novel shift in the first three births to a later point in the life cycle (Hirschman, 1986:179-80).

Nevertheless, Hirschman did not see the episodal rise in the Malay TFR as a brief interruption of a long-term convergence of Malay, Chinese, and Indian reproductive patterns. Data from the 1974 Malaysian component of the World

Fertility Survey showed that on average Malay women wanted 0.6 of a child more than Chinese women and 1.1 children more than Indian women. Moreover, the ethnic differences were stronger in actual than in desired births. At lower levels of education (below seven years of schooling), the mean number of children ever born to Malay women fell below that of Chinese and Indian women; but at higher levels of education, Malay fertility was greater. The stronger depressive impact of higher education on Chinese and Indian than on Malay rates of cumulative fertility meant that a continuation of national progress in educational achievement should prevent an ultimate disappearance in ethnic differences in cumulative fertility in Peninsular Malaysia. In short, Hirschman's analysis rejected the characteristics hypothesis in favor of the minority group status hypothesis.

If the minority group status hypothesis is true for Peninsular Malaysia, it is important to ascertain the links through which higher education exerts stronger antinatalist influences on the Chinese and Indians. Hirschman (1986:181) speculated on two such intervening mechanisms. First, he claimed that "anxieties" over the potential educational achievement of their children have been aggravated among the Chinese and Indian couples since 1971, in response to the conversion of English-medium schools to Malay-medium schools, the creation of quotas for Malay enrollment particularly at tertiary levels of schooling, and the offer of full government

scholarships to most Malay (but few Chinese or Indian) students in secondary schools and universities both at home and abroad. In an environment with limited resources, the favor of one ethnic group with special educational privilege effectively penalizes the others. Since Malays are not faced with this discrimination, one would expect that better-educated Malay parents would have to make fewer sacrifices (including childbirth) than their Chinese or Indian peers in order to educate their children to a similar or higher level.

A second mechanism through which higher educational attainment by women might depress fertility more for Chinese and Indian wives is through channelling them into jobs in the formal sector (Hirschman, 1986:181). It is in such occupations that incompatibilities are most likely to arise between women's work and child care. This problem has typically been solved by middle-class women through the hiring of domestic labor from within their own ethnic community. However, rising wages have increasingly drawn young women into jobs in the formal sector and have narrowed the pool available for domestic service. This dearth has been especially keen for Chinese and Indians. In rural areas, the majority Malays have a much larger pool from which to draw domestic help. In urban areas, the Malays, while a numerical minority, are better positioned to receive familial or community assistance in finding less educated rural women for urban domestic employment. This line of reasoning implies that the employment

of women in the formal, white-collar sector would depress Chinese and Indian fertility more sharply than Malay fertility but that this relationship would be more evident in urban areas, where formal, white-collar jobs take up a larger segment of the female labor force.⁸

Thus according to Hirschman, the competition between a mother's work role and child care, and the aspirations for socioeconomic mobility of children, impose a greater constraint on non-Malays than Malays. While Hirschman argues that these two factors work to depress non-Malay fertility, he does not investigate this point further nor does he relate existing social barriers in Malaysia to the minority group status hypothesis.

Using the same 1974 Malaysian Fertility and Family Survey, Tan (1981) addresses the minority group status question directly by focussing on the relationship between ethnicity, socioeconomic status, and fertility. He concluded that in the national and nonmetropolitan areas, where the Malays constituted the majority, the minority group status hypothesis was supported, regardless of whether socioeconomic status was measured by wife's education or husband's occupation. In the metropolitan area however, where Malays and Chinese were almost evenly balanced, the characteristics

⁸For a detailed discussion of the maternal role incompatibility hypothesis, refer to Mason and Palan, 1981, "Female Employment and Fertility in Peninsular Malaysia: The Maternal Role Incompatibility Hypothesis Reconsidered," Demography 18:549-576.

hypothesis held. These findings led to the conclusion that in 1974, local concentrations of Chinese or Indians could alleviate the economic and psychological pressures of minority group status and thereby remove the independent significance of ethnicity on fertility.

Tan's usage of the term "minority group" was unclear and inconsistent. In his study, Tan defined a minority group as any ethnic population numerically smaller than the majority, and lacking political and economic power. Using this criteria, he classified the Chinese and Indians as minority groups in the national and non-metropolitan areas, and the Indians alone as a minority in the metropolitan areas. His rationale was based on the argument that while Chinese and Malays were numerically similar in the metropolitan areas, the Chinese had economic power, while the Malays had political power. Tan's definition therefore isolated Indians alone as a minority who faced insecurities. This is contradictory to his earlier statement that 'the political dimension is probably more important than the economic factor, because political power more than economic power tends to promote group dominance and cause marginality and insecurity within minority group members' (p.48). Moreover, he uses the words 'ethnicity' and 'minority group' synonymously and does not offer any explanation of 'insecurities'. Being a member of a minority group does not necessarily imply marginality and insecurity. These points are discussed further in the next chapter.

More recent indications of the validity of the minority group status hypothesis within the Malaysian context are available from a Malaysian survey of 1,413 wives and 475 husbands interviewed in 1980 as part of a multinational study of 20 ethnic groups living in Indonesia, Malaysia, Philippines, Singapore, and Thailand (Noor Laily et al., 1985). The study found that for the urban sample, even though Malay women had slightly more years of schooling (8.0) than Indian (7.3) and Chinese (7.1) women, fertility as measured by the number of children ever born did not differ much for the three ethnic groups (3.5, 3.5, and 3.3 respectively). The same trend was discerned in analyzing the employment status of urban women. The percentage of women currently employed was highest for the Malays (43.1), followed by the Chinese (35.4) and Indians (31.0). This conclusion supported the characteristics hypothesis in the urban areas in line with Tan's conclusion for metropolitan areas.

However, the researchers then conducted a multiple classification analysis, in which they held constant the effects of a number of economic and demographic factors (e.g. wife's education, employment status, husband's education and occupation, wife's age at and duration of marriage, and number of years of residence in an urban area). Net of these effects, the mean number of children ever born to Chinese and Indian women fell below that of Malay women both in rural (4.06, 3.89, and 4.23, respectively) and urban (3.47, 3.19, and 3.63

respectively) residences (Noor Laily et al., 1985:104 and 106). These results rejected the characteristics hypothesis in favor of the minority group status hypothesis in both rural and urban Peninsular Malaysia. Although "rural" is not synonymous with "nonmetropolitan," the geographical designation used by Tan (1981), my interpretation of the findings of Noor Laily et al., for rural women, is consistent with Tan's conclusion for nonmetropolitan areas. Noor Laily and colleagues' failure to reject the minority group status hypothesis for urban women, seemingly inconsistent with the work of Tan (1981), could have resulted because, their survey data were gathered in 1980, six years after the survey used by Tan. Since the number of children ever born is a cumulative measure of fertility, it is plausible that the impacts of the 1971 NEP may have raised the awareness of Chinese and Indians of their disadvantages but may not have become manifest in the fertility of urbanites until the end of the decade.

The problems encountered in previous research into the minority group status hypothesis will be addressed in the next chapter, where we lay down some basic minimum criteria for classifying a minority group, and from documentary evidence draw the linkage between membership in a minority group and the insecurities that arise from it. Most importantly, this research will extend Tan's work by addressing the critical question of whether fertility behavior of Chinese and Indians has diverged from that of the Malays over time in line with

changing cultural and structural dis-assimilation brought about by the NEP and the NPP, which Tan could not address, because of the timing of his data set.

More recent research on ethnic fertility differentials has provided some insights into the impact of the NEP and NPP. Pooling together data from the vital registration system and population censuses of Malaysia, Lim et al (1987) studied the effect of age structure, marital patterns and marital fertility (by parity) on the fertility declines for each of the three main ethnic groups in Peninsular Malaysia. They found an overall decline in birth rate in Peninsular Malaysia, which they attributed to a number of factors. Age at marriage rose for all three ethnic groups, and there was an almost complete shift from parent-arranged to self-arranged marriage, which accompanied the expansion of education (especially for women), rising prosperity and wider employment opportunities for women. At the same time, rates of divorce fell sharply for Malays, and age differences between spouses narrowed, especially among Malays and Indians. The trend in fertility decline however, differed by ethnic groups with Chinese and Indians experiencing sharper and continuing declines, while Malay fertility fell less sharply, and levelled off in the early 1980s. This they attributed to an increase in period fertility for Malays between 1978 and 1983, perhaps due to the emergence of a high fertility region in the east coast states, and the persistence of high fertility norms. Moreover, they

suggested that recent policy changes - NPP - which exhorted Malaysians to 'go for five' and encouraged early marriages and large families may have affected Malay thinking, especially since it appealed to ethnic solidarity and was linked to religious revivalism. However they concluded that Malay fertility transition will continue because of demographic pressures albeit at a much slower pace than for nonMalays, as did Hirschman (1986).

Leete and Tan (1988) and Cheung (1989) also concluded that the recent decline in TFR was largely due to a delay in the timing of marriage for all ethnic groups and to significant declines in marital fertility and completed family size among nonMalays. For Malays the decline in marital fertility was arrested from the mid-1970s onwards and was felt in the reversal of the TFR, which was attributed to a catching up of births among those who delayed marriage. However, Cheung is unclear if the decline would resume later but goes on to argue that the rise in Muslim fundamentalism resulted in Malays resorting to less effective family planning methods. He also suggested that the Malay population would be more responsive to the NPP because they are largely concentrated in the rural areas, have larger family-size preferences and are more receptive to political messages. This was supported by Leete and Tan (1988) who analyzed the 1984/85 Malaysian Population and Family Survey and confirmed that family size expectation had gone up by as much as two children among

Malays in response to the NPP, and also due to religious revivalism. Cheung argued that to the extent that this is true, the NPP would 'inadvertently' increase ethnic fertility differentials. Nevertheless he concluded that whether the NPP is pronatalist or not could only be gauged in the long run, and that the incentives offered by the Malaysian government may not be substantial enough to bring about a long term reversal in fertility decline for Malays.

Leete (1989) examined the dual Malay-nonMalay fertility trends in Peninsular Malaysia by analyzing the marriage profiles of birth cohorts using data from the 1984/85 Malaysian Population and Family Survey. He attributed the depressing effect of nonMalay fertility to 'large proportions (20%) of Chinese and Indian women remaining unmarried in the 1950-54 birth cohort -a cohort that was moving through its peak childbearing ages from mid 1970s to mid 1980s. He noted that the reduction in the proportion of Malay women ever married at age 30 and above are less marked (12%). He suggested however that the later age at first marriage had not been accompanied by a postponement of childbearing, but a reduction in higher order births of fourth and fifth parity for nonMalays. For Malays however, there had not been a similar decline. Like Hirschman (1986) and Lim et al (1987) he attributed the boost in Malay period fertility in the late 1970s and early 1980s to a catching-up of postponed births. Another reason for the dual fertility trend, as cited by

Leete, is that while the proportion of nonMalays using effective contraceptives had increased over time, the reverse was true for Malays. For example, in 1974, while the percentage of Malays, in the 1965-69 marriage cohort, using an effective method was 24 percent it declined to 15 percent in 1984. He supported Cheung's suggestion that the leveling of Malay fertility could be due to a rise in Islamic fundamentalism that had affected the perceptions of women's role and their social behavior, especially in the rural areas, but admits that its effects are difficult to pinpoint, especially since Malay fertility in neighboring Thailand, Singapore and Indonesia have not followed a similar trend. He then went on to argue that government intervention via the NPP had some impact. For example, there was a significant drop in the number of new family planning acceptors, and a significant fraction of the sample of Malay women stated that they had revised their family size expectations upwards in response to the NPP. Among the youngest marriage cohort, 1970-74, there was an upward revision of almost two children in expected family size from 3.9 in 1974 to 5.7 in 1984-85. While there was also an upward revision among nonMalays, this revision was less marked and targeted at a lower family size. He concludes that political and religious factors have played a central role in the recent leveling of Malay fertility, factors which are not taken into consideration in demographic transition theory.

Saw (1990) examined a number of variables that could account for ethnic fertility differentials in Peninsular Malaysia using data from vital statistics and censuses. He attributed the retardation in fertility decline in Peninsular Malaysia to a slight rise in Malay fertility due to a marked decline in divorce rate and the slowing down of family planning activities in the rural areas, and argued that since Malays are demographically in the majority, they exert a greater influence on overall fertility trends. However, like Cheung, he was of the opinion that it was too early to say if the NPP will act pronatalistically for Malays but suggests that nonMalays have perceived it to be a stimulant for Malay fertility and growth which would ultimately increase the Malay proportional representation in the overall population.

Jones (1990) analyzed Malay fertility transition in Southeast Asia, drawing from data collected from vital statistics, censuses and surveys. He questioned why rapid and sustained economic growth lowered Malay fertility less drastically in Peninsular Malaysia than in Singapore Thailand or Indonesia, and like Leete (1989) suggested that important institutional and political elements underlie the divergent ethnic fertility trends in Southeast Asia. He identified one such element as the perceived opportunities of one's ethnic group in a multi-ethnic society, and another as the effect of a range of government and community influences on individual behavior. According to Jones, the fertility decline among

Malaysian Malays in the 1960s and 1970s was due entirely to a ✓ rise in female age at marriage. However, marital fertility during the 1970s remained unchanged. This he attributed to a sharp rise in first, second and third order births, although there was a fall in higher order births of four and above. But the subsequent rise in Malay fertility after 1978 was mainly due to a rise in third to fifth order births. While he admits ✓ that these could have occurred due to a shift in the timing of births consequent on the rise in age at marriage, there was also a rise in desired fertility. He thus argued that a decline in marital fertility was not consonant with a rise in age at marriage and pointed towards other underlying causes that needed to be taken into account. According to him, the period following the implementation of the NEP, in 1971, increased minority insecurities and the consequent restrictions on access to education and employment for Chinese and Indians influenced their family size goals. In contrast, the increased benefits accruing to Malays from the NEP, coupled with the rise of Islamic fundamentalism, which stressed family life, and women's role, as secondary to that ✓ of men, resulted in an upward revision of the ideal and desired family size expressed by Malays, and a tendency among Malays to increasingly use less efficient methods of contraception, even when factors such as education, occupation and income are taken into account. This together with the earlier low-key family planning efforts, especially in the

rural areas, and the introduction of the more recent NPP, which many Malays and nonMalays construed as government-sponsored pronatalism directed at the former group, could have set apart Malays in Peninsular Malaysia, from their counterparts in Thailand, Indonesia, and Singapore, who experienced much lower TFRs. This according to Jones is because in a multi-ethnic society the share of Malays in the population is of crucial concern, and in the case of Malaysia, even though Malays are a numerical majority and have a defacto monopoly of political power, they are constantly aware of the economic strength of nonMalays, especially Chinese, who comprise more than a third of the population. He went on to argue that while pronatalist policies in European countries have not been successful, they could have very different outcomes given the political scenario in Peninsular Malaysia.

While this recent surge in research attempting to explain the divergent Malay-nonMalay trend in fertility in Peninsular Malaysia, has pointed to the importance of institutional elements, none of them attempted to measure the impact of policies on desired fertility. This is perhaps due to the fact that they have had to resort to using data collected from censuses and surveys, that either span a relatively short period of time, or to time-series data that are typically highly aggregated. My own research supercedes previous research in that it measured the impact of policies based on micro-level data - the two Malaysian Family Life Surveys -

which documented in detail the social, economic, political and demographic experiences of Malay, Chinese and Indian women, covering a long span of time from before Independence in 1957 to after the introduction of the NPP in 1982. This data allowed two types of comparison - between two different cohorts of women, interviewed in 1976 (MFLS-1 Sample) and 1988 (MFLS-2 New Sample), and between the same cohort of women (Panel Sample) interviewed in 1976 and 1988.

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CHAPTER III

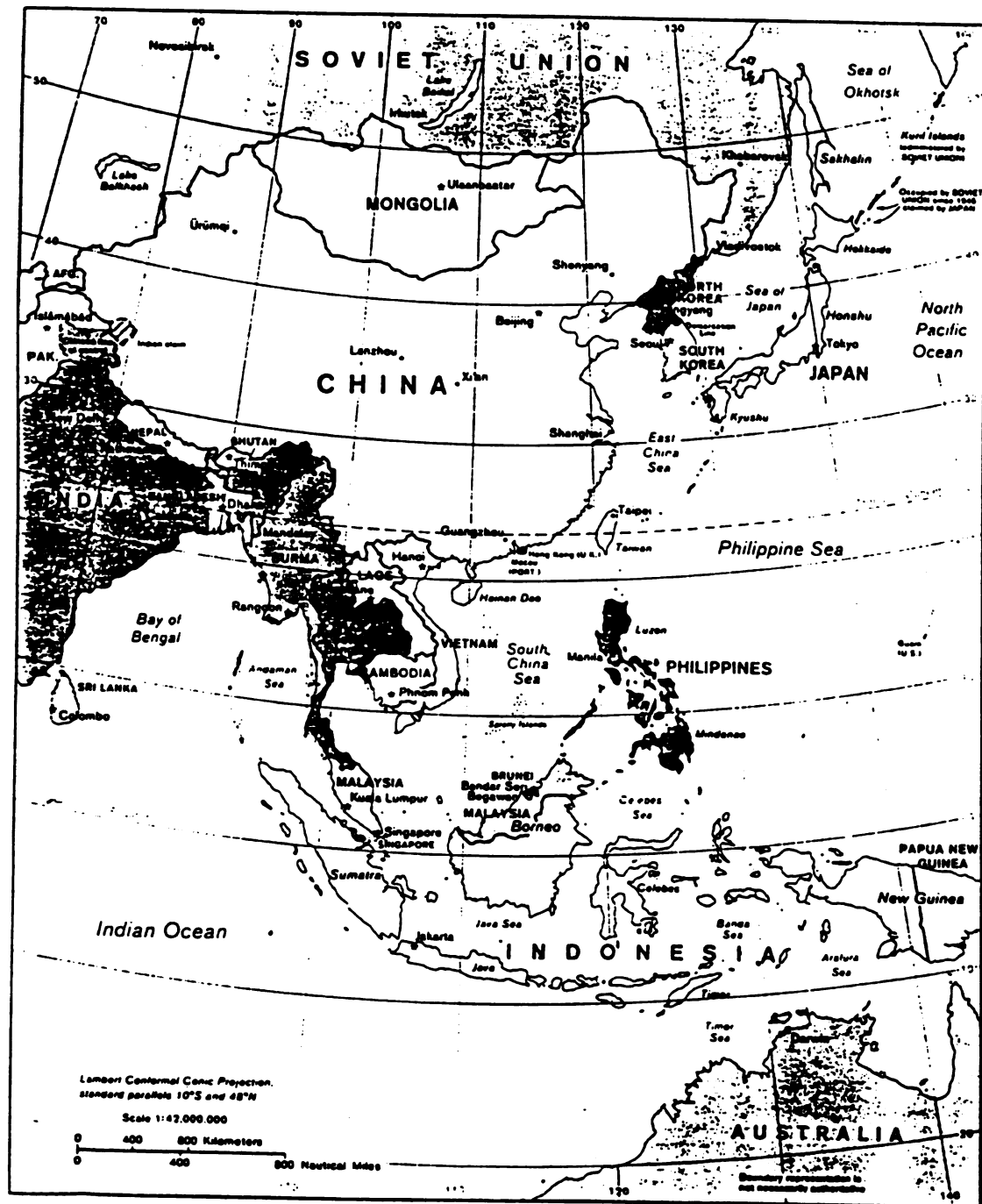
HISTORICAL OVERVIEW AND POLICY IMPLICATIONS

In order to understand the relationship between Malays, Chinese, and Indians in Peninsular Malaysia, we need to address two important questions. Firstly, what is the social process that has created the present ethnic matrix in Peninsular Malaysia, and secondly, what are the mechanisms that have maintained the social, economic and political differences between them? These two questions are addressed in the section on historical overview. I then discuss the importance of ethnicity within this context and lay down some basic minimum criteria for classifying a minority group. Finally in this chapter, I review evidence documenting the presence of barriers to upward social mobility and draw the linkage between membership in a minority group and feelings of insecurities that may arise from the presence of these barriers.

Historical Overview

Peninsular Malaysia has historically been at the crossroads of trade between India, China and Europe (refer to Figure 2). Early Malaysian history was interwoven with various

Figure 2
Malaysia And The Far East



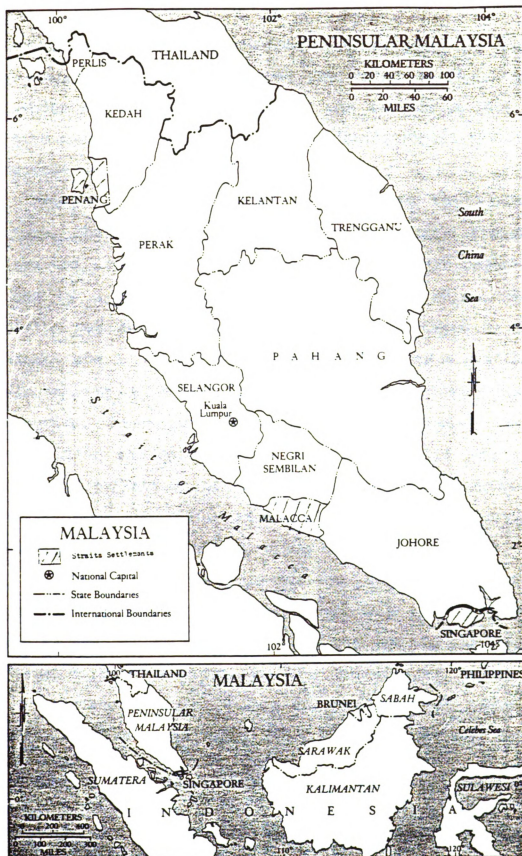
Buddhist and Hindu empires and was only superseded by Islamic influence in the fifteenth century. The earliest migrants to the Peninsular were Malays⁹ who were descendants of Proto-Malays from the neighboring Thai and Indonesian islands. Their migration according to Hodder (1968) took place sometime between the years 2,500 and 1,500 B.C. Much more documented however, is the more recent migration of Malays from the Indonesian archipelago, since the beginning of the fourteenth century (Smith, 1952; Saw, 1963).

Interactions with Europeans began more seriously with the incursion of the Portuguese who captured Malacca¹⁰ in 1511, and who were displaced by the Dutch in 1641. The present ethnic matrix however is a legacy of the British colonial rule. British intrusion began with the takeover of Penang in 1786. They then went on to capture Singapore in 1819 and defeat the Dutch in Malacca in 1824 (Sundram, 1989). They were guided initially by the need to establish ports-of-call for the East India Company (located in India), whose ships were trading between India and China. From these bases their influence spread to the other areas, and by the beginning of the First World War in 1914, they had control of the entire Peninsular.

⁹The Malays should not be confused with the 'Orang Asli' or 'Original Peoples' who were the indigenous people on the Peninsular.

¹⁰Peninsular Malaysia is made up of 11 states, namely, Johore, Kedah, Kelantan, Malacca, Negri Sembilan, Pahang, Penang, Perak, Perlis, Selangor, and Trengganu, and the Federal Territory of Kuala Lumpur (refer to Figure 3).

Figure 3
Peninsular Malaysia



Source: Young, Kevin, Bussink, Willem C.F., Hasan, Parvez (1980).

With the outbreak of the Second World War in 1941, the country was overrun by Japanese forces who ruled it until their surrender and subsequent return of the British in 1945. The British continued to rule the country until August 1957, when independence was finally granted.

Prior to the arrival of Europeans in the sixteenth century, the Peninsular was made up of several states or sultanates, comprising a collection of riverine basins and headed by a Malay ruler or "Sultan." The main economic activity was agriculture and fishing, undertaken by Malay peasants who lived off the land and who gave a portion of their takings as tribute to the Sultans, in return for their protection. Commercial activities were limited to barter trade, along the coast and in Malacca, and the growing of spices and extraction of tin in the hinterland, between the early Chinese and Indian settlers and the traders from the East and West, who also paid taxes to the Sultans.

In these early times, there was considerable harmony and acculturation among the Chinese and Indian settlers and the local Malays, as evidenced by intermarriage and the adoption of local culture and practices (Tan, 1983; Nagata, 1974).¹¹ Due to a shortage of women within their own ethnic group, the Chinese married local Malay women. While these locally-born

¹¹For a more comprehensive discussion of the changing relationship between the three ethnic groups and the role of the British in bringing this about, refer to Hirschman, 1986, "The Making of Race in Colonial Malaya: Political Economy and Racial Ideology," Sociological Forum, 1(2):330-361.

Chinese or "Babas" as they were called, subsequently adopted Malay customs, language, clothing and food, they very rarely adopted Islam as their religion. Over time most of their offspring increasingly tended to marry among the Chinese community, and the evidence of the earlier Chinese-Malay intermingling soon vanished (Saw, 1990). The intermingling among the minority of immigrant Indian-Muslims and Malays however, was more long-lasting, because they were bound through a common religion. While these Indian-Muslims became fully integrated within the Malay community, the vast majority of Indians were non-Muslims and did not integrate with the Malays. Given the low incidence of integration, the three main ethnic groups continued to maintain their distinct cultural heritage.

The influence of commercial capital was felt in a big way only with the coming of the British who set up new trading centers and increased the demand for local products. The industrial revolution in the nineteenth century brought with it increased demands for raw materials, especially tin and rubber, which outpaced the supply generated by the traditional mode of production. The discovery of huge deposits of tin ore in Perak and Selangor in 1850, and the shortage of labor to exploit it, encouraged the first large wave of Chinese immigrants. This was followed soon after by the massive importation of cheap labor from India in 1880, to work in the large rubber plantations, established by the British to cater

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to the rising demand for rubber, as a consequence of its newly discovered use in the automobile industry.

These new waves of immigrants were encouraged and controlled by the British, who dictated their location in separate and specific parts of the Peninsular. Hence unlike their migrant ancestors, there was little intermingling between the majority of Chinese and Indians, and the local Malays. Occupationally too, there was segregation, as Malays continued to live off the land in a subsistence economy, while the Chinese and Indians worked for wages in a cash economy. The effect of colonialism thus created distinct ethnic divisions, each group remaining culturally unique, engaged in different economic activities, separated geographically and segregated by an ethnic school system. To offset the growing nonMalay population, the British also encouraged the influx of migrants from Indonesia, who because they shared a similar ancestry, religion and culture as the local Malays, quickly merged with them and took on a local identity.

In order to safeguard their commercial interests, which were threatened by feuding factions of Malay rulers, British Residents were established, whose leadership reigned supreme in all matters, except those pertaining to religion and customs. To appease the local rulers and to legitimize their colonial rule, the British initiated land laws and provisions in the civil service and education, safeguarding the privileges enjoyed by the elite Malays before the British

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takeover. Free education was provided for Malay children, but not for Chinese and Indians. This education, conducted in the English Language, emphasized literary rather than scientific, commercial, or technical training, and was designed to train Malay elites for civil service employment. This laid the foundation for the 'special rights', according preferential treatment to Malays (Cheema, 1978). Following World War Two and the end of the Japanese occupation, the British attempted to introduce a centralized political and administrative structure, under the flag of the Malayan Union. However this was vehemently opposed by the Malay elite, who rallied against British rule in the wake of nationalistic sentiments, and clamored for stronger representation in the running of the Peninsular, through the United Malay National Organization (UMNO). A compromise was reached under the Federation Agreement of 1948, which ensured the sovereignty of the Malay rulers, and the special position of the Malays as indigenous people.

The formation of UMNO in the wake of greater local participation, also initiated the birth of the Malayan Chinese Association (MCA) and the Malayan Indian Congress (MIC), the equivalent representative parties, to safeguard the political interests of those Chinese and Indians who were economically advanced. These three communal parties were united in their broader concern for political emancipation and a national identity. Together they came to be known as the Alliance

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party, and instituted mechanisms for communal bargaining in the redistribution of economic benefits and the managing of communal conflicts.

The constitution which was drawn up as a first step towards self-governance, was implemented following Independence in 1957. It provided for a titular head of state, to be picked from among the Sultans, once every five years, and Islam as the state religion, safeguarded by the authority of the Sultans in their respective states. The constitution also reaffirmed the 'special position of the Malays' as *bumiputras*,¹² by reserving for them four-fifths of all jobs in the civil service, three-fourths of university scholarships and training programs offered by the federal government, and a majority of licence permits for the operation of trade and business (Snodgrass, 1978). In return for recognizing the special position of the Malays, Chinese and Indians were granted citizenship in the country if they fulfilled requirements of birth in the country or residence for a specified length of time, and an opportunity to participate fully in the political process of the country (Milne, 1967). However, there was an inherent problem in this ethnic alliance. Only a minority of Malays and non-Malays held political or economic power, with the interests of the majority disregarded in this arrangement. Malay peasants

¹²Literally translated, this expression means 'sons of the soil.'

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lagged behind their non-Malay counterparts in socioeconomic development because they did not participate in the cash economy.

Since independence, the government has instituted vigorous social and economic programs specifically targeted at the agricultural sector, in an effort to uplift the productivity and thus the income of Malays, who continued to dominate the sector and whose income level was far below that of Chinese and Indians. Various rural development plans were drawn up to improve the economic conditions of the Malays and reduce their dependence on Chinese middlemen. Land development schemes were initiated to provide land for landless Malays and initiate self-reliance. The government also encouraged the movement of Malays from rural to urban areas, by setting up training facilities for urban employment. However, by the end of the sixties, because of elite domination in the economic and political spheres, the majority of Malays still lagged behind their nonMalay counterparts in all aspects of economic life, even while the Malays were politically dominant. The Malays, disgruntled with continuing Chinese and British domination over the economy, became increasingly vocal in expressing dissatisfaction over the ineffectiveness of the government in uplifting the socioeconomic status of the Malays. The nonMalay working classes, on the other hand, were disappointed with government policies which downgraded vernacular education and language. This, coupled with

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aggravation over policies that gave preferential treatment to Malays in government employment, the provision of business licenses, and scholarships, encouraged nonMalays to turn towards opposition parties for leadership (Sundram, 1989). This discontent on the part of the majority of Malays and nonMalays was demonstrated in the dramatic fall in grassroots support for the Alliance Party in the 1969 general elections, which was followed shortly by the worst ethnic riot in the country's history.

A state of national emergency was declared, and sweeping powers were given to the National Operations Council (NOC), made up predominantly of Malays (Cheema, 1978). The NOC responded to Malay resentment by amending the constitution and drafting a new economic charter, which came to be known as the New Economic Policy (NEP), which was primarily aimed at improving the lot of the Malays. Although parliamentary democracy was restored in 1971, Malay political domination took on a new dimension. Malays came to represent 84 percent of registered voters, and district boundaries were constantly redrawn to assure a Malay majority. The government's role in the economy changed from that of providing basic infrastructural facilities to direct intervention in the economy to safeguard Malay interests. The non-Malays who although continued to be represented in the government, lost their earlier political gains and were relegated to unimportant positions in the cabinet. The ability of Chinese

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and Indians to form opposition coalitions were severely restricted under the Internal Security Act, which acted to repress any serious threats to the ruling political alliance. These elements of change following the ethnic riots reinforced ethnic differences and exacerbated minority insecurities.

The New Economic Policy

The NEP, which was incorporated into the Second Malaysia Plan, 1971-1975, was to be implemented over a 20-year period from 1971-1990. It had a two-pronged development strategy. Firstly, to eradicate poverty, irrespective of ethnicity, and secondly, to eliminate the identification of ethnicity with economic functions (Malaysia, 1971). While the first goal emphasized increasing productivity and income, increasing opportunities for intersectoral movements and providing social services, within the framework of a rapidly expanding economy, the second was primarily targeted to reduce interethnic disparities. Unlike previous strategies, the NEP laid down definite targets for improving the lot of the Malays. It proposed that Malays and other indigenous people were to "own and manage at least 30 percent of the total commercial and industrial activities of the economy in all categories and scales of operation" (Malaysia, 1973:81). Programs and policies to achieve economic balance among the three ethnic groups included modernizing and creating new economic activities in the rural sector for Malays, providing them with

facilities for higher education in science and technology, modernizing industries in the rural sector, providing training to facilitate the movement of Malays from rural to urban areas, creating a Malay entrepreneurial community, and increasing Malay participation in modern-sector activities.

The NEP demonstrated the political will of the Malays to intervene successfully in the national economy to safeguard their interests. It was specifically aimed at preserving the special rights accorded to Malays, through specific policies that acted as barriers to the normal progress of the non-Malays. Three arenas in which nonMalays acutely felt the disadvantages associated with the NEP are in the areas of education, employment, and access to ownership of assets.

A constitutional amendment passed by the House of Representatives in 1971, which reserved a quota of places within local institutions of higher learning for Malays, has since reduced the number of nonMalays enrolled in tertiary education. Between 1970 and 1980, while the percentage of Malays enrolled in tertiary education locally increased from 40.2 percent to 66.7 percent, the number of Chinese and Indian students decreased from 48.9 percent and 7.3 percent, to 26.2 percent and 6.0 percent respectively (Liang, 1987). Government policies have also encouraged the setting up of educational institutions, such as the MARA Institute of Technology and the National University to cater almost exclusively to Malay students. Furthermore, from 1983 onwards the Malay language

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began to be used as the medium of instruction at all levels of education, thus increasing the barriers to non-Malays. Moreover, scholarships from the Federal, State and other private institutions have been mostly reserved for Malays. For example, in 1980, of 8,625 students awarded scholarships to study abroad, only 2.5 percent were non-Malays (Liang, 1987). For those non-Malays who could afford to send their children to foreign universities, another barrier was placed. The government denied recognition for academic degrees awarded by the Nanyang University (the premier Chinese university) in Singapore and several other universities in Taiwan and India.

The NEP also laid down specifications on the ethnic composition of employment in the private sector to 'reflect the multi-racial composition of the population' (Snodgrass, 1978:8). Although no precise targets were stated, it can be interpreted to mean that Malays must come to represent at least 50 percent of total employment, in line with their compositional representation in the population, in those industries and occupational groups in which they have been underrepresented in the past. Towards achieving this end, the government has not only openly displayed hiring preferences in the public sector, but has also pressured private enterprises to add Malays to their payrolls. This is especially obvious in the civil service, where an estimated 90 percent of employees are Malays, heads of departments are almost always Malays, and almost all employees in the most powerful government

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department, the Public Services Department which is responsible for the hiring and promotion of all civil servants, are Malays.

Perhaps the most concerted effort to promote Malay participation, under the guise of eradicating poverty, was in the area of commerce and industry. The NEP targeted that the Malay share in ownership and control of all types of productive enterprise in the country must rise to at least 30 percent by 1990. A number of public enterprises, such as Bank Bumiputera, Petroleum National Berhad, National Corporation Limited, and the State Economic Development Corporations (SEDCs), were created under the monopoly of state control, specifically to foster the setting up of Malay businesses, and exclude possible competition from non-Malays, especially Chinese. Permodalan National Berhad was set up to act as a holding company for the purchase of shares in private enterprises, on behalf of Malays who could invest as little as M\$10. These public enterprises, which are under the protection of state power, aimed to eventually transfer all or part of their capital to individual Malay shareholders. For example, within the 166 companies affiliated with the SEDCs, 80 percent of the staff are Malays. By 1984, the total capital of these companies amounted to M\$1.5 billion with businesses ranging from agriculture to manufacturing and tourism, and nearly 70 percent of the 3,400 contracts signed up to then were issued to Malays (Liang, 1987).

Besides the structural barriers imposed by the NEP on non-Malay advancement, they also faced legal ramifications under the Internal Security Act (which can imprison anyone for up to two years without a trial), when constitutional amendments passed in 1971, deemed as seditious the discussion of topics related to the power and status of Malay rulers, Malay special privileges, matters pertaining to citizenship rights, Malay as the National Language and Islam as the official religion of the country.

The year 1971 thus marks a historical turning point for all the three ethnic groups in Peninsular Malaysia. The increased domination of UMNO in the political alliance, and the cowing of public opinion under the Internal Security Act, coupled with the historical insecurities associated with citizenship rights, has markedly affected the confidence of Chinese and Indians in their future. The Internal Security Act has also rendered ineffective, the formation and coalition of opposition parties to represent the interests of non-Malays. The NEP in contrast to earlier policies, has acted as an effective tool in translating government policies into action and has contributed towards exacerbating the insecurities associated with membership in a minority group. Whether this has actually been translated into reduced or deferred childbirth is but one objective of my research, which also aims to ascertain if the barriers felt by the presence of the NEP is being translated into lack of support, on the part of

the non-Malays, for the New Population Policy implemented in 1984.

The New Population Policy

Population growth in Peninsular Malaysia can be divided into two distinct phases. The first, covering the period up to the Second World War, was characterized by large-scale immigration of Chinese and Indians. Population growth during this phase was dictated by colonial migration policies which fluctuated with economic conditions and the demand for labor. The second, from 1947 to the present, was characterized by natural increase, brought about by the changing political climate following the Second World War, and restrictions on immigration.

Despite the sharp rise in fertility in the post-war era, there was no official government policy on family planning until the early 1960s. Concern over the adverse effects of a rapid population growth, initiated a Cabinet decision to form a sub-committee, in 1964, to review population trends and their impact on the country's social and economic development. Following its recommendations, the National Family Planning Board (NFPB) was established in 1966, under the auspices of the Prime Minister's Department. Its three principle objectives were: to improve the health and welfare of the family through voluntary acceptance of family planning; to reduce the population growth rate from 3 percent in 1966 to 2

percent by 1985; and by so doing to increase per capita income from M\$950 to M\$1,500 during the 20-year period. It was hoped that this targeted reduction in population growth would stabilize Malaysia's population at around 30 to 40 million by the year 2100 (Arshat et al., 1988).

However, in September 1982, in a dramatic reversal of policy, the Malaysian prime minister, Dr. Mahathir Mohammad, announced to the UMNO general assembly that given the country's land area (329,759 sq. km.) and ample natural resources (Malaysia is currently the world's leading producer of rubber, palm oil and tin), it could support a population of 70 million. He also argued that a larger but productive population will enlarge the size of the domestic market, support industrial growth and reap economies of scale, as well as reduce the dependence on export-oriented industries. Furthermore, given the fact that labor shortages had begun to emerge in certain sectors of the economy (although there was a national unemployment rate of approximately 8 percent at that time), the country's economic planners viewed population as a reservoir of employable skills and services to be tapped for developmental efforts.

Towards achieving this end, the New Population Policy (NPP) was formulated and incorporated in the Mid-Term Review of the Fourth Malaysia Plan, 1981-1985. It aimed at a reduction in the total fertility rate by 0.1 children per woman, every 5 years, so as to achieve the replacement level

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fertility of 2.05 children per woman by the year 2070. According to this projection, the population will stabilize at around 70 million by the year 2100 (Arshat et al, 1988). Following the implementation of the NPP, the National Family Planning Board was reconstituted as the National Population and Family Development Board, and the Government announced that maternity benefits of 42 days and 60 days of paid leave for public sector and private sector employees, respectively, will now be provided for the first 5 births, an increase from 3 births. Furthermore, the maximum allowable tax deductions for up to five children, was increased and reversed to an increasing sliding scale, from the previous downward scale (refer to Table 3).

Table 3
Maximum Allowable Deductions For Children

Child	1960-1978	1979-1983	1984 Onwards
First	\$750	\$850	\$650
Second	\$500 (\$-250)	\$700 (\$-150)	\$750 (\$-100)
Third	\$500 (\$ 0)	\$600 (\$-100)	\$800 (\$+ 50)
Fourth	\$300 (\$-200)	\$500 (\$-100)	\$800 (\$ 0)
Fifth	\$300 (\$ 0)	\$400 (\$-100)	\$800 (\$ 0)
Total	\$2,300	\$3,000	\$3,800

Note: Figures within brackets indicate the change for each subsequent child.

Source: The Ad-hoc Committee on Population Issues; 1983:36. Arshat et al; 1988:6.

Given the tenuous position of the non-Malays under the NEP, it is plausible that they would not seize the incentives

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offered by the NPP, to have more children. In contrast, the increasing benefits accruing to Malays since 1971, may in fact encourage them to avail themselves of the incentives under the NPP. This research will therefore also look at fertility behavior of the three ethnic groups since 1984, controlling for socioeconomic and demographic variables, to ascertain if the diverging fertility trend between Malays and non-Malays is strengthened by the presence of the NPP.

Ethnicity and Minority Group

Studies on the minority group status hypothesis have not for the most part examined the meaning of ethnicity, minority group, and the intergroup relations that lead to the practice of antinatalism on the part of minorities. In this section, I address these concepts.

Schermerhorn (1978) identified an "ethnic group" as having the following characteristics: existence within a larger society; a real or fictional common ancestry; memories of a shared historical past; and a cultural focus on one or more symbolic elements seen as the essence of their peoplehood, such as language, diet, dress, phenotypical features, or kinship patterns, or any combination of these. Of course, the social collectivity patterned by these four dimensions must possess an awareness of membership and a knowledge of boundaries; that is, they must have a consciousness of kind.

Ethnicity is socially ascribed, and unlike class is not based on socioeconomic differences. Nevertheless, it has important social, political, and economic consequences for the various ethnic groups involved, and helps to determine whether an ethnic group is deemed a minority or a majority in the sociological sense. According to Hirschman (1987), the crucial characteristics of an ethnic minority is that its unique configuration on the four dimensions of ethnicity listed above must align with other ideological, social, and economic divisions in society to create and maintain inequality. It is implicit in Goldscheider and Uhlenberg's (1969) thesis too, that antinatalism on the part of a minority group will be evident only if that group is marginalized and is unable to use political power to secure its economic interests.

As evidenced in the previous discussion, ethnicity in Peninsular Malaysia has traditionally played an important role in access to economic and political power. The three ethnic groups of interest in this research are Malays, Chinese, and Indians. As these labels suggest, membership in each group implies a common descent from a specific nation of origin and a matrix of cultural symbols which include uniqueness in phenotypical features, religion, and language. In Peninsular Malaysia the conjunction of ethnicity and religion dichotomizes the religious arena into a Muslim and non-Muslim field. The Malays are the earliest inhabitants of the Peninsular. Originating mostly from Indonesia, they are

Muslims by birth, and speak Malay. The non-Muslims are mostly made up of Chinese and Indians. The Chinese practice Buddhism and ancestor worship. More than one language variant is spoken by the Chinese, but Hokkien and Cantonese are the most common, given the heavy inflow from the southern part of the People's Republic of China. Most Indians practice Hinduism and speak Tamil, Hindi, Telugu, or any of several other languages indigenous to the Indian subcontinent. However, since the vast majority of them originated from South India, the Tamil-speaking Hindus predominate. There is a small percentage of Christians among the Chinese and Indian communities. The important point however, is to recognize that although cultural heterogeneity is more diverse within the Chinese and Indian groups, than among the Malays, it does not prevent either from coalescing around a common ethnic identity.

Like ethnicity, religion is deeply intertwined with the individual's sense of self and power in Malaysia. Malay-Muslim identity is materially reinforced, since Malays who venture into the non-Muslim arena are liable to lose their social and political privileges, as *bumiputras* (Ackerman and Lee, 1988). On the other hand, Chinese, Indians and other non-Malays who are Muslims, are not necessarily guaranteed the same ethnic privileges as Malays. In the non-Muslim field therefore, the connection between ethnicity and religion is less rigid, since it is not undergirded by any material privileges. In contrast to the Malay-Muslim unity, the non-Malays are religiously and

politically fragmented, and this has prevented them from coalescing around a common identity despite the recognition among non-Malays that they are not Muslims.

Ethnic differences have become exacerbated in recent times by Islamic fundamentalism which followed in the wake of the Iranian Revolution in the late 1970s. The fundamentalist movement which surged during this period of time emphasized those elements that divide Muslims from the other religious groups, such as a more 'Middle Eastern form of dress, *halal* food prepared according to religious rules that made it more difficult for Malays and nonMalays to eat together, opposition to women's sports and mixed-sex social activities, even small social irritants such as the injunction against Muslim women shaking hands with men' (Jones, 1990:509).

The review of literature on minority group status hypothesis suggests the adoption of some minimum criteria for eligibility as a minority group. Membership in a minority group has implied numerical subordination (Blalock, 1967; Browning, 1975), economical and political subordination (Kennedy, 1973), or the presence of a historical pattern of opposition from and discrimination by the dominant group (Peterson, 1964). In the case of Peninsular Malaysia, both the Chinese and Indians are numerically in the minority , in the overall population, and in the rural areas. But in the urban areas, the Chinese population equals the size of the Malay population. The Chinese continue to be economically better off

than the politically dominant Malays. The Indians on the other hand suffer from political, and of recent, economic subordination too, in both the rural and urban areas. In a recent study of some 200 households, Puthucheary and Tan (1987) confirmed that poverty was highest among the Indian households, with 38 percent of the Indian households earning less than M\$300 a month, while the figures for Malay and Chinese households were 20 percent and 13 percent respectively. Their study also confirmed that on average, Malay respondents reported receiving higher education than Chinese or Indian respondents, with about 23 percent of Malay women for instance, having 6 or more years of education, compared with 11 percent for Chinese and 2 percent for Indians (p.8). While the above definitions clearly categorize the Indians as a minority group, in both the urban and rural areas, the case of the Chinese is less clear.

While the Chinese exert most of the economic power in the urban and rural sectors, the Malays monopolize political power and are having success in converting it into superior economic power, as documented in the discussion of the NEP. As such, even though the Chinese may have economic power, the fact that the Malays have historically held political power, and the means to control violence in society (that is, control over the armed forces and military), shows they are able to advocate and implement policies to cater to their special interests, thus creating insecurities for the non-Malays.

Under these conditions therefore, the third criteria mentioned above -- namely, the presence of a historical pattern of opposition from and discrimination by the dominant group -- would be most applicable to classifying the Chinese and Indians as minorities in both the urban and rural sectors, in this research.

Central to the minority group status hypothesis is the argument that external discrimination leads minority groups to have smaller families in order to enhance their position in society. Implicit in this argument is the notion that for the minority group status to affect fertility, the minority group must have desired and attained acculturation, by which is meant the adoption of the culture of the majority. Schemerhorn (1978) advances a typology that explains minority group integration in society. According to him, every minority will have as its intergroup goal 'either closer relations with the dominant group and acceptance of its standards (way of life) - a centripetal aim - or some type of separation, either physical or cultural, from the dominant group and more inclusive societal bonds - a centrifugal goal' (p.21). Of importance here is not the choice that a minority makes, but the acceptance or non-acceptance of the choice by the dominant group. The theoretical development of Goldscheider and Uhlenberg assumes that the majority group will exert centrifugal, not centripetal, pressures on the minorities. In the case of Peninsular Malaysia, acculturation, by members of

the minority Chinese and Indian group, has occurred not out of choice but rather out of necessity. The Malay language is designated as the national language and is the language of operation within the school, work and business environment. Islam, the religion of the Malays, is the official religion of the country and dominates the cultural sphere. Even though there is religious tolerance within the country, the Islamic culture pervades all aspects of social life in Malaysia. Under these circumstances, ethnic integration in Malaysia operates differently, whereby the minority groups express centrifugal goals but meet with disagreement from the majority group which imposes centripetal goals. While both situations foster conflict, the minority group status hypothesis has only been tested for the first situation. My research will test the minority group status hypothesis for the second situation.

Minority Insecurity

Finally, previous research on the minority group status effect has presumed the presence of insecurities, and has gone on to test their impact on fertility without actually documenting their presence. Moreover census data has been used as an adequate source of evidence documenting the presence of the minority group status effect. In order to overcome this limitation, I conducted a small survey in July 1989, of 21 female respondents residing in the capital city of Kuala Lumpur and employed in senior positions in the Government

service. Ethnically they comprised a random sample of 6 Malays, 6 Indians and 9 Chinese. Due to the sensitivity of the subject, no direct questions were posed about ethnic insecurity and fertility behavior, however, some indirect questions reveal answers to this relationship. It is important to note that due to the small sample size, my findings can only be suggestive and by itself does not demonstrate anything definitively. In this section, I review certain pertinent questions and offer an interpretation of the results.

In answer to the question, "In your opinion, which ethnic group has the most influence in Malaysian society today?" 90 percent of the respondents said that Malays were the most influential, with Chinese and Indians being less and least influential respectively. One Malay respondent and one Indian respondent thought that Chinese were the most influential, followed by Malays and Indians. Irrespective of ethnic background therefore, the majority of respondents recognized Malays as having the most clout in Malaysian society, suggesting that political domination reigns supreme over economic power.

In an effort to ascertain why parents want/do not want children, the following question was posed:

-- What do you consider to be the single most important disadvantage of bringing up your children in Malaysia?
1) rising cost of living; 2) rising educational costs;

3) rising unemployment; 4) spending time on them; 5) worry about children's future; 6) others (specify).

The most common response was 'worry about children's future' with responses from 10 out of 19 respondents, or more than half of those who answered this question. Malays were least worried about their children's future (20 percent), with Indians expressing greater concern (50 percent) and Chinese being most concerned about their children's future (75 percent). Thus inspite of their economic hold over the economy, Chinese expressed the greatest insecurity for their children's future in Malaysia. The next most common reply was 'rising educational costs' with 2 Malays (33.3 percent) and 1 Chinese (12.5 percent) citing this as the most important single disadvantage. This could be interpreted to mean that as more and more Malays enter tertiary education, they face keener competition, from among their own ethnic counterparts, for limited government scholarships, thus incurring costs to higher education. For Indians 'rising cost of living' was an important reason with 33.3 percent citing this.

Another question that could point towards a better understanding of insecurities and childbearing patterns is "Compared to your own circumstances, do you think that your children will have greater/lesser/equal opportunities for: 1) a university education; 2) a white-collar job; 3) political influence; 3) social influence; 5) earning a higher income?"

The most significant replies were found in response to parts 1, 2, and 3 above. 57.9 percent of the respondents said that their children faced lesser opportunities for a university education and a white-collar job, while 61 percent stated their children had lesser opportunities for political influence. Of those Malays who responded only 50 percent, compared with 57.1 percent of Chinese and 66.7 percent of Indians, thought their children had lesser opportunities for a university education. In contrast, 66.7 percent of both Malays and Chinese stated their children had lesser opportunities for a white-collar job, while only 50 percent of Indians thought so. In terms of political influence, 71.4 percent of Chinese and 66.7 percent of Indians, compared with 33.3 percent of Malays, stated that their children had lesser opportunities for political influence than themselves. In a request to specify why they thought their children had lesser opportunities, 3 non-Malays specifically cited the 'New Economic Policy and the political clout of the Malays' as being the cause.

Although my own survey did not query respondents on whether they translated insecurities into reduced childbearing, some insights can be gained from information on the mean number of children per woman and the desire to have more children. Malays had slightly more children than non-Malays with 2.33, 2.11 and 1.67 children per women for Malays, Chinese and Indians respectively. In spite of the fact

Malays had a larger family size on average, only 16.7 percent of those interviewed said they did not want any more children, while the percentage for Chinese and Indians was 77.8 percent and 33.3 percent respectively. I suggest therefore that the greater insecurities expressed by the non-Malays is being translated into reduced childbearing, given a similar socioeconomic environment.

One question was posed that directly related to the New Population Policy. Interestingly enough, all respondents who answered, unanimously said that they would not have more children to help achieve the 70 million population target. Further insight into the ethnic response to the NPP can be gained from the 1984/85 Malaysian Population and Family Survey which posed a number of questions on the knowledge, attitude and reaction of the public to the NPP, to some 4,141 ever married women. Of the 3,887 women who responded, approximately 60 percent of them had heard of the NPP, and 90 percent of these women interpreted it to mean that the government wanted a larger population. However, 90 percent of the women also stated that the Policy did not influence them to want more children than what they had originally intended to have (Arshat et al, 1988).

Khor (1989) analyzed these findings in terms of ethnicity, controlling for the confounding effects of age at marriage, education, rural-urban residence, income and parity. She found that Malay women were almost five times more likely

to desire additional children than nonMalay women. She went on to examine the reasons why these women wanted more children and concluded that generally both Malay and nonMalay women who wanted additional children were younger, with a lower parity, and poorer, and were motivated by the expectation of economic and psychological support from their children. While the nonMalay women were more likely to come from the rural areas, their Malay counterparts were equally likely to come from rural as well as urban areas.

Of the women who did not desire more children in response to the NPP, the likelihood was greater for nonMalay women who resided in urban areas to cite inability to provide adequate attention, and financial difficulties, as reasons for not wanting too many children. Khor also found that nonMalays were eleven times more likely to favor a smaller family size, when controlling for age, education, income, residence and parity, supporting my own conclusion.

To summarize, this research will supersede earlier research on ethnic fertility differentials in a number of ways. Previous research has not focussed on measuring minority status in terms of structural discrimination caused by government policies and programs. While the independent or facilitative role of the government in effecting changes in fertility is perhaps the most controversial and difficult-to-measure component, the controversy however, is not about the role of the intermediate variables in how they affect

fertility but the extent to which government policies and programs have an independent causal effect on these intermediate variables. My research seeks to address this very issue by analyzing the changes in desired fertility expressed by Malay, Chinese and Indian women: not exposed to either the NEP or the NPP; exposed to the NEP alone; and exposed to both the NEP and NPP, while controlling for demographic and socioeconomic differences.

This research is also important because it will re-examine the minority group status hypothesis as a theoretical framework for investigating ethnic differences in fertility within the context of Peninsular Malaysia, in which minority groups express centrifugal goals but meet with disagreement from the majority group which imposes centripetal goals.

Finally, this research will extend Goldscheider and Uhlenberg's hypothesis beyond the urban environment. Their hypothesis implies that for the effect of minority group status on fertility to hold, the minority must desire or achieve upward socioeconomic mobility, a phenomenon assumed possible only in an urban economy. As such, Goldscheider and Uhlenberg's theory has been applied to urbanites only. However, my contention in this research is that even while the minority is striving for structural assimilation, the independent effects of minority status may operate in either a rural or an urban economy. As such I hypothesize that ethnicity will remain strong even if rurality is significant.

CHAPTER IV

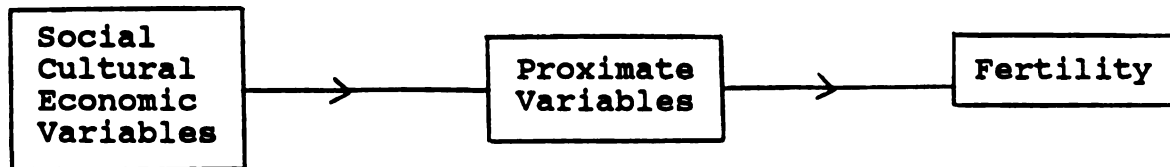
RESEARCH DESIGN AND DESCRIPTION OF DATA

This chapter describes the research design that will guide the investigation into the impact of government policies on fertility. Specifically the research is designed to fully exploit the rich micro-level data available in the two Malaysian Family Life Surveys (MFLSes), which spans over the last five decades, covering the dramatic changes that have occurred in the political arena from before Independence to after the implementation of the NEP and NPP. In this chapter I also describe the sources of the data used in the research, the survey instruments, the purpose of the surveys, the derivation of the sample size used in testing the research hypotheses, and the quality of the data collected.

Conceptual Framework

Fertility is mediated by a set of variables that define exposure to intercourse, the probability of conception, and the probability of successful gestation and parturition. These "proximate variables," as conceptualized by Davis and Blake (1956), provide the link between social, cultural and economic factors in the general environment on the one hand, and the

Figure 4
Davis And Blake Framework



physiological processes which ultimately determine fertility on the other (refer to Figure 4).

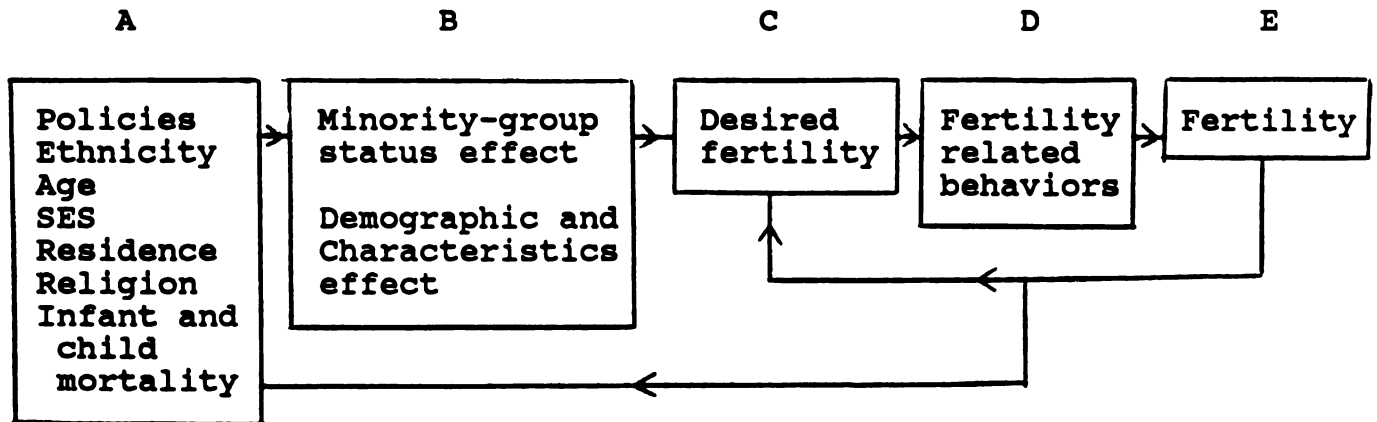
From this basic model a more analytical framework can be formulated to provide the basis for identifying the key variables to be measured, and testing the research hypotheses for linking them. The conceptual framework guiding this research is a reduced form of Davis and Blake's model. In this research I will examine the influence of the first set of variables on the third, without getting into the measurement of the proximate variables.

Figure 5 shows the structural relationships among those broad determinants, relevant to my analysis, and their link to fertility.¹³ It can be divided into five categories, moving from left to right as follows:

Box A includes some of the exogenous variables found in the general environment and relevant to my analysis. They are treated as independent of each other and taken as given.

¹³There may be feedback effects from fertility to the proximate variables, socioeconomic status (SES), residence, religion, and infant and child mortality, and policies, ethnicity and age, which are not shown in Figure 4 since the focus of this research is with the outcome in desired fertility.

Figure 5
Simplified Version Of the Conceptual Framework



Policies, specifically the NEP and NPP, together with ethnicity, are the most important exogenous factors since the goal of this research is to examine how the effects of policies on fertility might vary by ethnic group. I argue that because the NEP is designed to promote the social, economic and political advancement of Malays, vis-a-vis the non-Malays, it exacerbates the insecurities suffered by minority Chinese and Indians. These insecurities cause minority group members to defer or limit childbearing and prevent them from taking advantage of the pronatalist benefits provided by the NPP. On the other hand, the NEP not only assures a more secure future for Malays, but also increases the net value of children (through subsidized education, for example). As such, they are encouraged to take advantage of the benefits offered by the NPP. The positive effect on fertility for Malays, of these two policies is hypothesized to offset in part or perhaps totally, the fertility inhibiting effects of socioeconomic development. ✓

As such I hypothesize continuing divergence in fertility between Malays and nonMalays.

As already illustrated in the previous chapter, ethnicity has a potentially important influence on the behaviors being investigated. Differences in fertility have existed between the three major ethnic groups in Peninsular Malaysia, ever since the beginning of ethnic heterogeneity, in the late nineteenth century. Over the last three decades, Government policies, more directly the NEP, and in a subtler way the NPP, have affected Malays and nonMalays, directly and indirectly through socioeconomic changes, with probably differing impacts on their fertility behavior. Separate models can be constructed for Malays, Chinese and Indians to show how they differ in influences on their fertility behavior over the years.

Age, one of the demographic variables being examined in this research, is closely related to fertility because it reflects the length of exposure to the risk of childbearing. It also defines the different socioeconomic and political changes experienced by different cohorts through history. For example, in this study, the interest is in looking at the impact of policies on fertility for those women who were in the childbearing ages of 15-49, over a span of five decades from 1940s to 1988. The three variables described above can affect the proximate determinants of fertility directly or

indirectly through SES, residence, religion, and infant and child mortality.

SES (socioeconomic status) has been cited as an important determinant of ethnic fertility differences in Peninsular Malaysia, as discussed in the literature review in Chapter II. The minority groups status hypothesis contends that ethnic differences persist even when differences in SES and demographic variables are controlled. As such it is important in this research to control for SES differences. SES can be measured in various ways. In this research SES will be measured by women's education, work status and household income. Their measurement is discussed in detail in the next chapter.

Residence is treated as a separate predictor variable from SES because it is hypothesized in this research that the strength of the minority group status effect will differ between rural and urban areas. Goldscheider and Uhlenberg's hypothesis implies that for the effect of minority-group status on fertility to hold, the minority must desire or achieve upward socioeconomic mobility, a phenomenon typically assumed to be possible only in an urban economy. However, my contention in this research is that the independent effect of minority group status may operate in either a rural or urban environment, as long as the minority is striving for structural assimilation. However, this effect may nonetheless vary in strength between rural and urban residents.

Religion, another explanatory variable, is closely related to ethnicity, as discussed in Chapter III. Religion's influence on fertility has been the subject of much debate. While Islam, Hinduism, Buddhism or the various Chinese beliefs may not directly impact fertility, religion is introduced here as a proxy for cultural practices, which are closely related to it but not easily measurable. For example, religion is closely related to cultural background, social relations and family systems. Hence using religion in data analysis will capture the significant aspects of these other variables.

Infant and Child mortality is another explanatory variable relevant for the study of fertility behavior. It is affected by policies, ethnicity and age of women, either directly or indirectly through SES, residence and religion. It has been argued that high infant and child mortality may lead to "child replacement" or "child survival" behaviors resulting in higher fertility (Scrimshaw, 1978; Simmons, 1979).¹⁴ Mortality also affects fertility directly because it determines the surviving number of children.

Box B is introduced to illustrate the linkage between minority group status effects and socioeconomic characteristic

¹⁴The "child survival" or insurance hypothesis argues that couples deliberately have more births than the desired number of surviving children to ensure that the desired number of children survive to adulthood. The "child replacement" hypothesis contends that parents try to replace children who die.

differences effects to the key variables to be measured.

Desired Fertility in Box C, reflects the fertility ideals and expectations of individuals. It, is affected by socioeconomic, demographic, and policy factors. In my research desired fertility is the key dependent variable. Direct and indirect measures of desired fertility can be derived from responses to questions on desired family size, whether more children are wanted, the wanted status of the most recent birth or pregnancy, and the number of additional children wanted (Bongaarts, 1990). Their influence on realized fertility can be mediated by such intermediate variables as contraception.

Box D represents the proximate variables that influence fertility directly, and include breastfeeding, contraception, marital duration and stability, and age at first marriage. For instance, government policies do not affect fertility directly but can affect directly the use or non-use of effective contraceptives. Furthermore they may do so differently for the three ethnic groups. Basically it is assumed that variables to the left of Box D influence fertility through one or more of the variables within this box.

Box E represents actual fertility behavior as measured by such indicators as children ever born and the length of each birth interval.

Since the purpose of this research is to ascertain the effects of policies on desired fertility, it will be restricted to an

examination of the effects of variables in Box A on Box C, and will not include an investigation of the behavioral avenues through which policies and SES variables affect fertility. Box D and Box E is introduced here to point out the sequence of events in fertility analysis.

Data For Analysis

Ideally, analyzing fertility behavior before and after 1971 and 1982, while controlling for socioeconomic changes and demographic variables, will point to the influence of the two government policies of interest here, and especially the NEP, which is the most instrumental policy affecting intergroup relations in Malaysia. However, the availability and access to comparable surveys before and after these specific years is limited. The next best alternative was locating retrospective surveys that have incorporated changes that have taken place over the decades from before the implementation of the NEP to after the implementation of the NPP. The two MFLSes are well-suited for this research. MFLS-1 was conducted in 1976, five years after the implementation of the NEP, with enough time for changes in fertility desires to emerge. It will therefore be used to assess the short-term impact of the NEP. MFLS-2 was conducted in 1988, six years after the first mention of the NPP and four years after the implementation of its tax and maternity benefits. Hence, it provides the opportunity to assess the impact of the NPP. Moreover, given that it takes

time for people to change their reproductive behavior, the 1988 survey, conducted 12 years after the NEP was introduced, would enable an assessment of the long-term impact of the NEP. for studying the policy effect on ethnic fertility behavior. I now turn to a description of the data used in this research. The two MFLSes are discussed separately and in doing so I point out how they are related to each other.

1. The First Malaysian Family Life Survey

The First Malaysian Family Life Survey (MFLS-1) is a longitudinal survey consisting of three rounds of data, gathered four months apart, in Peninsular Malaysia in 1976 and 1977.¹⁵ It was carried out by the RAND Corporation, in cooperation with the Malaysian Department of Statistics, and Survey Research Malaysia, a private firm. The survey was designed to elicit information on key economic and biosocial factors affecting fertility behavior among individual households. Its goal was to identify factors amenable to public policy influence that directly or indirectly affect fertility outcome.

The Sampling Frame

The survey population was defined as private households, containing at least one ever-married woman each, less than 50

¹⁵The timing of the three surveys is as follows:
Round One - 23 August to 13 December 1976;
Round Two - 12 January to 14 April 1977;
Round Three - 13 May to 10 August 1977.

years old at the time of the initial visit. The sample households were selected from Primary Sampling Units (PSUs) each with probability proportional to the number of dwelling units.¹⁶ This sampling frame, originally developed for census purposes by the Department of Statistics, was acquired by Survey Research Malaysia in 1967 and since then regularly updated to minimize differences arising from changes in population growth and residential development. The size of each PSU is maintained at approximately the same number of dwelling units, the norm being 220. The initial sample, drawn for the purpose of this survey, was inspected for underrepresentation of key occupational and ethnic groups. It was found that it did not contain sufficient numbers of households in one of the key occupational groups - fishermen. There was also underrepresentation of Indians. As such three PSUs were purposively selected to give additional representation to Indian families and to families living in fishing communities. The final sample of households were drawn from 52 PSUs. A random sample was then taken of all the

¹⁶The total number of PSUs in Peninsular Malaysia at the time of the survey was estimated at 6,000. A PSU is defined as a land unit falling into one of five population density strata, made up of metropolitan towns (comprising a population of more than 75,000), census towns (with a population between 10,000 and 75,000), non-census town (whose population is below 10,000), urbo-rural towns (with a population below 10,000 and with at least 50 percent of its workforce engaged in nonagricultural occupations), and rural areas (comprising all the remaining areas). As such the PSUs are an exhaustive coverage of the land area of Peninsular Malaysia (Jones and Spoelstra, 1978).

dwelling units¹⁷ within each selected PSU. Of the 2,088 dwelling units thus selected 1,813 were located and interviewers were sent to list all women in each household¹⁸ between the ages of 15 and 50, who had ever been married. From this group, one woman per household was selected at random and interviewed for the MFLS-1. The effective sample of women interviewed in the first round was 1,262 of which 603 or 47.8 percent were Malays, 496 or 39.3 percent were Chinese, 148 or 11.7 percent were Indians, and 15 or 1.2 percent were Others (Jones and Spoelstra, 1978). For the purpose of this research Others were dropped. See Table 4 for details on response rates for the following rounds.

The Survey Instruments

Rand project leaders in collaboration with the staff of the Census and Demography Division of the Department of Statistics, Malaysia, devised the questionnaires that were administered in the survey. These questionnaires were fieldtested in a number of socioeconomic settings, and were further developed, before being translated into the three main vernacular languages of Bahasa Malaysia, Mandarin and Tamil.

The questionnaires in the survey instruments were

¹⁷A dwelling unit is defined as a unit of accommodation which is separated from free public access, usually by a door that is lockable.

¹⁸A household was defined as a group of people who sleep under the same roof and eat from the same cooking pot. Thus each dwelling unit could contain more than one household.

Table 4
Summary Of Responses By Interviewing Round

	Round One	Round Two	Round Three
	2088	2088	2088
Total Number of DUs			
Ineligible DUs			
Vacant	131	128	128
Demolished	98	99	99
EMW over 50 years	285	285	285
No EMW	136	136	136
Total Eligible	1438	1440	1440
Non-response Cases	176	204	233
Completed Cases	1262 (87.8)	1236 (85.8)	1222 (83.8)
Malay	603 (47.8)	592 (47.9)	591 (48.4)
Chinese	496 (39.3)	481 (38.9)	473 (38.7)
Indian	148 (11.7)	148 (12.0)	143 (11.7)
Others	15 (1.2)	15 (1.2)	15 (1.2)

Source: Jones and Spoelstra, 1978:16.

designed to elicit data on demographic dependent variables (pregnancy intervals and outcomes, lengths of lactation, contraceptive use), primary demographic and biological conditioning factors (marital status, spouse separation, child deaths, lengths of postpartum amenorrhea), major determinants of opportunity cost of a woman's time with children (woman's time-use in particular activities and compatibility with child care, availability of child-care substitutes), major components of the family's economic resources (family income and wealth, economic value of children, availability of substitutes for economic value of children), and community factors of primary interests (characteristics of private and public supplies of contraceptives, weaning foods, schooling, water sanitation, and medical services) (Fain and Tan, 1982). The survey instruments are listed in Table 5.

Table 5
Summary Of MFLS-1 Survey Instruments

Questionnaire	Eligible Respondents	Round(s) in Which Administered
MF1: Household Roster	Selected ever-married women (EMW) less than 50 years old, or other eligible adult female	Administered completely in 1; updated in 2 and 3
MF2: Female Retrospective	EMWs	Administered completely in 1; updated in 2 and 3
✓ MF3: Male Retrospective	Present husbands of EMWs	<u>Administered in 1 only</u>
MF4 and MF5: Female and Male Time Budgets	EMWs and their present husbands	Administered completely in 1, 2 and 3
MF6: Income and Wealth	Male heads of household or other members of household that contains an EMW less than 50 years old	Administered completely in 1, 2 and 3
✓ MF7 and MF8: Female and Male Attitudes and Expectations	EMWs and their present husbands	<u>Administered in 2 only</u>
MF9: Networks of Economic Support	EMWs	Administered in 3 only
MF10: Migration and Urban Assimilation	Present husbands of EMWs	Administered in 3 only
MF11: Community Information	Village chiefs, midwives, and other knowledgeable persons	Administered throughout the survey

Source: Fain and Tan, 1982:4.

Fieldwork

Twenty-five female interviewers from all over Peninsular Malaysia, were recruited and trained. They were chosen on the basis of educational attainment, completion of Form Five (12th grade) being a prerequisite, and language proficiency in the English language and their own mother tongue. The Chinese interviewers were selected on their knowledge of the main Chinese dialects. Five of the interviewers were designated as office editors and coders, while the remaining twenty, made up of ten Malays, seven Chinese and three Indians, were designated as field workers. Training included field trials mounted on a questionnaire-by-questionnaire basis, using respondents from nonsample PSUs in the Kuala Lumpur and Petaling Jaya areas.

While in theory the PSUs could be classified as having a Malay, Chinese or Indian majority population, ethnic matching of interviewers with respondents on this basis could pose problems when dealing with a minority ethnic group. Moreover, no two PSU had the same ethnic mix. Hence in order to match interviewers with informants, the former were shuttled from PSU to PSU to ensure that the ethnicity of the interviewer matched that of the household. In the urban areas on the west coast, all three ethnic groups were working together, but in the east coast, where Malays dominate, the team consisted of eight Malays and one Chinese. Because the Indian households were highly concentrated in rubber estates and scattered in

the urban PSUs, two Indian interviewers concentrated on a majority Indian PSU, while the third Indian remained with the main team, to cover those Indian households scattered over the other PSUs. Although households that posed serious language problems were eliminated in the initial stages of identifying an eligible household, quality controls were not always possible, especially when dealing with minority Chinese dialects, because of a shortage of such qualified Chinese interviewers. Token gifts of toiletry items were given to respondents as an incentive and as a show of appreciation.

Quality control was imposed by three field supervisors, selected on the basis of their prior training and work experience. Like the interviewers they too underwent a rigorous period of training. The supervisors made at least one visit to each household in Round One. They were responsible for ensuring that the questionnaires were correctly administered, inspecting all questionnaires before sending them for editing and coding, so as to rectify omissions, incomplete data and illegible recording. In the second and third rounds of the survey, factual questions were readministered for validating prior information collected, however, because of language, logistical and timing constraints, fully independent backchecking of each interviewer's work was not carried out.

Field control was maintained by a graduate executive, who was responsible for controlling the supervisors, and organizing and planning their movements. An important responsibility was ensuring that the schedule of a four-month reference period was maintained. The executive was also responsible for back-checking, and rectification of errors identified at the editing stage.

Coding and Computing

Office checking was done on a completed case basis, with a coder working through all the questionnaires from one household. During Round One, the coders made field trips to work with interviewers, check or have recanvassed completed questionnaires. Since a large part of the questionnaires was precoded, this helped interviewers understand the coding functions and edit their own work in the field, and minimize discrepancies.

The checked entries were then punched in a systematic operation, onto computer cards, and later transferred to machine tapes for analysis. The key-punch operation was supervised by a data processing executive, who verified all key-punched cards. The data was then subject to a machine edit, and any omissions and inconsistencies rectified by referring to the original questionnaire, and through logical reconciliation.

Accuracy of MFLS-1

The quality of data on a number of issues pertaining to fertility, contraceptive use, infant and child mortality, breastfeeding, and education were checked for reliability of answers, internal consistency and plausibility of patterns in the data. Omissions, overreporting of events, misreporting of the timing of events or the duration of intervals between events were the types of error investigated (Haaga, 1986).

According to Haaga (1986), the data on fertility from the pregnancy histories seem to be highly accurate, as evidenced by the comparison of age-specific fertility rates, calculated for various periods covered by MFLS-1, with those calculated from vital statistics for the same periods. Low birthweight reported for infants in the MFLS-1 correspond with reported infant mortality rates from vital statistics and life tables. However, as expected, information on such sensitive issues as fetal mortality and contraceptive use, is underreported, especially by younger women. Information on the prevalence of breastfeeding, age at weaning, ethnic and rural/urban differences were noted to correspond with other sources eliciting similar information.

A major problem for users, as identified by Haaga, was digital preference with regard to breastfeeding and amenorrhea, where frequency distributions showed excessive values at multiples of six months.

The information on formal education was deemed accurate from comparisons with external sources. However for the small number of women who were educated to secondary level, schooling at the age of fifteen is not reported in the life histories. Haaga concludes that this is due to omissions in the life histories, since women reported being in school in later rounds of the survey.

Using multivariate statistical analysis, Haaga also investigated the accuracy of MFLS-1 data on fertility, breastfeeding and amenorrhea, varied with characteristics of the respondents and with the length of the recall period. He found that, even when controlling for education and literacy, Chinese respondents were more likely to give accurate information than Indian or Malay respondents, the latter group being the least accurate. As expected, the more educated and literate respondents more accurately answered survey questions. Also, urban respondents were more likely than their rural counterparts to give better data, probably because of the educational difference. Finally the length of the recall period also affected data quality, with an increase in the recall period associated with a decrease in the quality of data. However, the respondent characteristics more strongly affected data quality than length of the recall period.

2. The Second Malaysian Family Life Survey

The Second Malaysian Family Life Survey (MFLS-2) was designed as a follow on to MFLS-1. It was a collaborative effort of the RAND Corporation, the National Population and Family Development Board of Malaysia (NPFDB), the United States National Institute of Child Health and Human Development and the National Institute on Aging. Field work for the survey began in August 1988 and was completed in January 1989. Like the MFLS-1, this survey elicited household retrospective and current data from women and their husbands, on fertility, nuptiality, migration, and mortality, as well as social and economic factors affecting family decision making. However, unlike MFLS-1, the survey was conducted in a single round. Furthermore, MFLS-2 added a senior sample, to support research on their living standards, health, and intergenerational transfers (Haaga, 1990).

The goal of MFLS-2 was to enable the study of household behavior in diverse settings during a period of rapid demographic, socioeconomic and political changes. Together with MFLS-1, these surveys allow the study of changes in household behavior over a period spanning five decades from 1940s to 1988, from before the NEP to after the NPP.

The Sampling Frame

The survey population was divided into four samples:

- the Panel Sample, consisting of the 1,262 ever-married women aged below 50 years at the time of the initial visit in 1976;

- the Children Sample, comprising the children, aged 18 or older, of the women in the Panel Sample;
- the New Sample, consisting of women aged 18-49, regardless of her marital status, or an ever-married woman under age 18; and
- the Senior Sample consisting of persons, both male and female, aged 50 or older.

Sampling for the New and Senior Samples was done in two stages. In the first stage, enumeration blocks (EBs) were selected from a sampling frame, based on the 1980 Census covering all of Peninsular Malaysia. This sampling frame is maintained by the Department of Statistics, and constantly updated to maintain the size of each EB to contain about 100 living quarters (LQs).¹⁹ Each year the Department of Statistics selects a sample of 2,500 EBs (of which two-thirds are urban, and one-third are rural) and updates the listing of living quarters (LQs) within each EB. For the MFLS-2, 401 EBs were selected at random from the updated 1987 sample. In the second stage 3,063 LQs were selected at random from a list of all the LQs, which had been stratified by ethnicity of the LQ occupant. In order to obtain sizeable samples for each ethnic group, Indian LQs were sampled at twice their percent composition of the population of Peninsular Malaysia in 1980. Malay and Chinese LQs were selected in proportion to their share of the non-Indian population in 1980. Interviewers then

¹⁹Living quarters are defined on the basis of having separate entrances to the outside, or to a public hallway. As such a block of flats would contain many LQs, while a house would only contain one. The living quarters is comparable to dwelling units within each PSU as defined in MFLS-1.

visited each selected LQ and listed all the residents²⁰ eligible for the New and Senior Samples. In households where there were more than one eligible woman, one was randomly chosen to be the primary respondent. 2,187 or 71 percent of selected LQs which had a woman eligible for the New Sample, successfully completed the interviewing process. See Table 3 for their ethnic composition.

There are fewer households in Malaysia having an older person as compared to a woman of reproductive age. As anticipated, of the 3,063 households selected, only 916 or 30 percent had a respondent eligible for the Senior Sample. As such a second list comprising those unselected LQs were drawn up, using a similar process of selection, as described above. From the 1,494 LQs thus selected, 493 eligible respondents were found for the Senior Sample. 1,359 or 30 percent of selected LQs having an eligible Senior respondent, successfully completed the interviews. Table 6 shows their ethnic composition.

The Panel and Children Samples originated from the 1,262 ever-married women successfully interviewed in MFLS-1. Follow-up field scouting revealed that 15 of these women had died during the interim period, 4 had moved either to East Malaysia or to a foreign country, a further 339 had relocated, and attempts to find them was unsuccessful, while 2 refused to

²⁰Residents are defined as those who usually eat and sleep in the LQ.

Table 6
Final Sample MFLS-2 By Ethnic Group

Sample	Malay	Chinese	Indian	Others	Total
New Sample	1129	570	455	33	2187
%	51.6	26.1	20.8	1.5	100
Senior Sample	602	433	315	9	1359
%	44.3	31.9	23.2	0.7	100
Panel Sample	492	296	101	13	902
%	54.6	32.8	11.2	1.4	100
Child Sample	675	254	156	9	1094
%	61.7	23.2	14.3	0.8	100

Source:Compiled from Haaga, 1990:19, 23, 30 and MFLS-2 Data.

participate in MFLS-2, leaving 902 respondents who were re-interviewed for MFLS-2 and made up the Panel Sample. Their ethnic composition is shown in Table 6.

One of the children aged 18 or over of the Panel Sample member still living with her was selected at random for the Children Sample and as many as two of the children aged 18 or over, living in separate households, were also selected at random for the Children Sample. Interviews were completed for a total of 1,094 respondents (refer to Table 6).

The Survey Instruments

The MFLS-2 survey instruments covered many of the same topics in MFLS-1. Where a topic was covered by both surveys, the MFLS-1 items were often re-used, and the same definitions adopted as far as possible. However not all the instruments used in MFLS-2 were identical to those used in MFLS-1. This is

because, being a single-round survey, it was necessary to condense the questionnaires in MFLS-2, and reduce the time pressures posed to respondents, especially in the urban sector. As such fewer separate instruments were used, for example, most of the items to be answered by the female respondent were grouped under MF22, the Female Life History questionnaire. For a detailed description of the survey instruments see Table 7.

The first drafts of the survey instruments were completed in April 1988 and circulated to colleagues at RAND, NPFDB, and at U.S. and Malaysian universities, for comments. Following revisions incorporated from suggestions from the above sources, the questionnaires were practiced on an "opportunistically selected, but diverse, sample of relatives, fellow workers, and neighbors" (Haaga, 1990, p.40). Following a second stage of revisions, all but two of the survey instruments (MF20 and MF26), were field-tested at nearly a 100 households in three sites - rural areas of Kelantan, the town of Seremban in Negri Sembilan state, and the city of Malacca and nearby villages - representative of a wide variety of social and economic settings. Additional pretests were carried out in subsidized housing estates in Kuala Lumpur. The survey instruments were in the three main languages of Bahasa Malaysia, Mandarin and Tamil.

Table 7
Summary of MFLS-2 Survey Instruments

Questionnaire	Eligible Respondent
MF21: Household Roster	Main Respondent. ²¹
MF22: Female Life History - marriage and fertility; child care and educational expenses; education and training; work history; migration and house characteristics.	All female respondents in Panel, Child and New Samples.
MF23: Male Life History - marriage history; education and training; work history; migration and house characteristics.	Present husbands of female respondents.
MF24: Senior questionnaire - marriage; children; health language and literacy; work history; migration and house characteristics; family background; help from relatives.	All respondents in the Senior Sample.
MF25: Household Economy - household possessions; ownership and household expenses; income earning activities; other income.	Main Respondent.
MF26: Community Data	Village chiefs, midwives and other knowledgeable persons.
Source: Haaga, 1990.	

²¹Membership of the household and relationships were defined with reference to the "Main Respondent". In households with a Panel Sample member, she was designated the Main Respondent. In households with members of the Children Sample (but no Panel Sample member), then a son or daughter of the Panel Sample member, selected for the Children Sample, was designated the Main Respondent. In households with a New Sample member, she was designated the Main Respondent. In households with a Senior Sample member (and no New Sample member), the Senior Sample member was designated the Main Respondent.

Fieldwork

Thirty-five interviewers and field scouts were selected from the regular staff of NPFDB, and forty-four more were hired temporarily for the MFLS-2. Selections were based not only on educational attainment, of at least nine years of schooling, but also to ensure a balance of the three ethnic groups, as it was planned, like in MFLS-1, to match the ethnic group of the interviewer, with that of the primary respondent. An added criteria was fluency in the major Chinese dialects, as well as in Bahasa Malaysia, Tamil and English. These recruits underwent intensive formal and informal training, including practice interviews and discussions.

Field work was conducted by three teams simultaneously. Each team had from six to ten field scouts and from thirteen to nineteen interviewers. The interviewers who were all female, were responsible for determining the eligibility of respondents, administering the questionnaires, checking and editing the completed questionnaires, and revisiting the households if necessary. The field scouts, who were male, assisted in locating the original MFLS-1 respondents and their children, and the selected households for the New and Senior Samples. They also conducted interviews to determine if the MFLS-1 respondent or her children lived at a selected LQ, provided transport for interviewers, interviewed most male respondents, and assisted in editing questionnaires and in conducting interviews for the community data. Each team also

included members of all three ethnic groups, roughly in proportion to the expected ethnic composition of the areas to be covered. The North team covered the states of Kedah, Pinang, Perak and Perlis; the South team covered Johor, Melaka, and Negri Sembilan; and the East team covered Kelantan, Pahang and Trengganu. After the completion of their designated states, the three teams converged at Bangi, in Selangor, to cover the two remaining states of Selangor and Wilayah Persekutuan. By December 1988, all of Peninsular Malaysia had been covered, and every PSU in MFLS-1 and EB in MFLS-2 had been visited at least once. For the following two months, a team of interviewers scouted the list of households, which were not completely interviewed. Each respondent was given a ballpoint pen as a token of appreciation.

Each team was headed by a senior field supervisor who had prior experience in household surveys, assisted by research officers who were responsible for collecting community data. Field supervisors allocated and assessed the work of each interviewer, field scout, and data entry person in their team and reported to the project directors. They were responsible for resolving discrepancies discovered in the data entry process and deciding on whether a revisit was necessary.

Coding and Computing

Recording forms were checked at least once by a supervisor or another interviewer before the data was entered. Usually the checking was done on the same day as the

interview, to ensure that all required instruments were completed, legible, and correct. Preliminary logic checks were also carried out by comparing dates from marriage, pregnancy and migration histories. Data entry was carried out by several of the interviewers who were also trained in data entry. They were assigned a programmer from MPFDB, to supervise data entry, make corrections and back-up copies. The data was entered into Compaq Portable II Microcomputers, that had a range check built into the programs, to isolate and delete out-of-range values. It also performed logic checks to correct data entry errors. Sampling weights were then created in the final data sets to account for the oversampling of Indians and to cater for the fact that some households contained more than one eligible respondent for the New Sample, and only one member per household was selected for the Senior Sample even if more than one eligible member was present. These weights were designed to make the samples representative of the Malaysian population in 1988.

Accuracy of MFLS-2

Given that MFLS-2 is a one round survey in contrast to MFLS-1, one would expect data validity to be lower than for its comparable counterpart. The accuracy of MFLS-2 is currently being studied at the RAND Corporation. In a preliminary report, Sine and Peterson (1990) compared MFLS-2 data with Malaysian Vital Statistics Reports, Malaysian Census Reports, and the published tabulations of the 1984/85

Malaysian Population and Family Survey (MPFS).

Sine and Peterson analyzed the representativeness of the New Sample. They pointed out that even though the sample is representative of the Peninsular Malaysian population in 1988, it becomes progressively less representative as one travels backwards in time. For instance, a cohort of women aged 40-49 in 1988, would be 30-39 in 1978. As such the sample does not capture the experience of women who were aged 40-49 in 1978. Any analyses of trends and events in earlier years might therefore be biased towards the experience of younger women, with the potential bias increasing as one proceeds backwards in time. Similarly the experience of women who died prior to sampling are not captured in the analyses of pre-1988 deaths and women who migrated out of Peninsular Malaysia are not represented in the sample. Any analyses based on MFLS-2 could therefore be biased, to the extent that these women's experiences may be different from those remaining in the sample frame.

Based on an examination of fertility data from the pregnancy records, Sine and Peterson's comparison of the sex ratio of births, mean number of children born per woman and fertility rates, with external sources, support the conclusion that MFLS-2 women accurately reported the number and timing of births. However, their analyses of the trends in age-specific fertility rates showed consistently higher rates than that calculated from vital statistics. Given the accuracy of birth

reporting, they concluded that MFLS-2 contains an overrepresentation of married women. This possibility is further confirmed by their analysis of the marriage data. However this will not pose a problem for my research, since the samples for testing the hypotheses contain only ever-married women.

Sine and Peterson also concluded that on the whole, MFLS-2 women reported birthweights and infant deaths accurately, accuracy being best among Malay women. It was also found that information on fetal deaths was more forthcoming from Malay and Indian women than from Chinese women. However, in contrast, Chinese women were more prone to report abortions and miscarriages. ✓

A comparison of contraceptive use between MFLS-2 women, and two external samples, revealed that the former appeared to underreport the use of contraceptives, though the pattern of use across age groups were similar. It was found that those aged 15-19 were most discrepant in their reporting. However, reports on methods used appeared to be consistent with external sources.

Finally like in MFLS-1, there was digital preference in the duration of breastfeeding in the MFLS-2 data, with peak values noted in multiples of six months. From an internal check on breastfeeding duration, Sine and Peterson concluded that the data on the duration of breastfeeding in MFLS-2 may not be reliable.

CHAPTER V

RESEARCH HYPOTHESES, MEASUREMENT OF VARIABLES AND METHODOLOGY

Having laid down the background for this research and described the data, I now turn to the discussion of the research hypotheses, methodology and measurement issues. A discussion of the research hypotheses is followed by a description of how the sample sets are obtained for testing these hypotheses. I then discuss the measurement of key variables used in this study and conclude by laying down the methodology to be employed for testing these hypotheses.

Hypotheses for Testing

This research examines whether minority insecurities are translated into reduced fertility desires and whether these are exacerbated by the presence of government policies - specifically the NEP and NPP. I hypothesize that the NEP evoked barriers for non-Malays that contributed to a deferment or limitation of childbearing and dissuaded them from making use of the incentives offered under the NPP. Alternatively the NEP increased the net value of a child more for Malays than for Chinese and Indians, and encouraged them to take advantage of the incentives offered by the NPP. Accordingly, everything

else the same, the minority group status hypothesis is tested by looking at ethnic differences in fertility over the span of three time periods:

- before 1971, the period least affected by either the NEP or the NPP; *affected by the New Policy only,*
- between 1971 and 1982, the period presumably affected by the NEP only; and
- after 1982, the period presumably affected by both the NEP and the NPP.

It is hypothesized that fertility differences will diverge over these three time periods for women differentially exposed to these policies, by ethnicity. Accordingly I hypothesize that:

Firstly, Malay women exposed to the NEP would desire more children than Malay women not exposed to the NEP, while Chinese and Indian women exposed to the NEP would desire fewer children than Chinese and Indian women not exposed to the NEP;

Secondly, Malay women exposed to both the NEP and NPP would desire more children than Malay women exposed to the NEP alone, while there would be no change in desired fertility between Chinese and Indian women exposed to both the NEP and NPP and Chinese and Indian women exposed to the NEP alone;

Thirdly, for all ever-married women the difference in desired family size among the three main ethnic groups will be greater in 1988 than in 1976, with Malays expressing a desire to have more children than Chinese or Indians, since Malays are more likely to have revised their expectation upwards, while nonMalays are more likely to have revised their expectation downwards. As such the Malay-nonMalay gap is hypothesized to be greater in 1988 than in 1976.

Fourthly, desired fertility for nonMalays is likely to be lower than that for Malays, irrespective of place of residence.

Confirmation of one or more of the above hypotheses while controlling for demographic and socioeconomic differences will imply support for the minority group status hypothesis.

These hypotheses will be tested for three sets of samples. The first sample comprised Malay, Chinese and Indian ever-married women in MFLS-1 who were aged below 50 years at the time of the survey in 1976, who responded to the questions pertaining to desired fertility. All women, irrespective of those affected by voluntary fertility limitations, were posed questions on their desired fertility. However, since MFLS-2 did not ask questions pertaining to desired fertility, of women/or whose husbands were not fecund, a similar exercise was carried out on MFLS-1 to make the two samples comparable.²² Of the 1,262 women in MFLS-1, 56 did not respond to the questions on desired fertility, 356 women and/or their husbands were not fecund, while there were 15 women classified as Others. Thus in this sample 835 women were eligible, of whom 52.3 percent were Malays, 38.0 percent were Chinese, and 9.7 percent were Indians. This sample was made up of women exposed to neither the NEP nor the NPP and women exposed to the NEP alone.

²²One could argue that the exclusion of women who were not fecund systematically biases the samples towards the experience of younger women. In order to see whether this was actually the case, preliminary analysis including all women, irrespective of their fecundity, was carried out. A comparison between the two samples, one including and one excluding fecund women, showed results that did not differ markedly.

In order to construct a comparable sample to that in MFLS-1, the sample from MFLS-2 was restricted to all ever-married women aged below 50 years at the time of the survey in 1988. This constituted the New Sample of 1,847 women. Those women or whose husbands were sterile or not able to have children were not administered the questions pertaining to desired fertility. This eliminated 316 cases. There were 22 others who fell outside the three main ethnic groups. The eligible 1,509 women in this sample were made up of 59.3 percent Malays, 24.3 percent Chinese, and 16.4 percent Indians. This sample was made up of women exposed to the NEP alone and women exposed to both the NEP and NPP.

A more poignant test of the research hypotheses is possible if the impact of the two government policies is examined for the same group of women. Thus the third sample set comprised women in the Panel Sample who were interviewed in 1976 and 1988. Of the 1,262 women in MFLS-1, 902 were reinterviewed in 1988. Of these there were 13 Others who were dropped from the sample, since the interest here is in looking at ethnic fertility differences among the three main ethnic groups. 48 others were eliminated because their response to the first question on desired fertility - Do you want any more children? - was "Don't know." In this sample women who were not fecund at the time of interview in 1988 were not administered questions pertaining to desired fertility. However, since they mostly comprised women who were not

exposed to either policy they were retained for comparison with women exposed to the NEP alone and women exposed to the NEP and NPP. It was assumed that these women did not want any more children at the time of interview in 1988 and that their desired fertility was their completed fertility. The final sample set comprised 841 women of whom 55.3 percent were Malays, 33.2 percent were Chinese, and 11.5 percent were Indians. This sample was made up of women exposed to neither policy, women exposed to the NEP alone and women exposed to the NEP and NPP.

Measurement of Key Variables

1. Dependent Variable

The two most important factors influencing the fertility of ever-married women are the number of children they desire, and the control of their fertility, either through deliberate practice of contraception or through the fertility-inhibiting effects of breastfeeding (Lin et al, 1987). As laid out in the conceptual framework, this research will analyze the influence of government policies on desired fertility, in the hope of contributing towards a better understanding of ethnic fertility differences in Peninsular Malaysia. While there are numerous problems associated with the measurement of desired fertility, which are raised below, as Ware (1974:15) pointed out, no other measure provides an equally effective index of the potential for change in family size in the developing

world. Moreover, although questions on family size preferences are not as reliable as measures of social and demographic characteristics, they rank well by comparison with other attitudinal questions (McLelland, 1983).

A review of the literature on desired number of children for Peninsular Malaysia, based on surveys conducted over the last 20 years suggest that desired family size for Malays has been higher than for Chinese and Indians. The 1966-67 West Malaysian Survey attributed this ethnic difference for Malays, to lower educational levels and a greater concentration in the rural areas. However, the narrowing of educational differences, and the increased urbanization of Malays has not reduced the wide ethnic differences in the mean desired family size of 5.0, 3.95, and 3.3 for Malays, Chinese, and Indians, respectively, as reported in the 1983 Survey on Health and Family Planning in Johore and Perak (Lin et al, 1987). This was confirmed by Rahman (1983) when he analyzed the 1980 Ethnicity and Fertility Survey and found that even when socioeconomic controls were applied, the Malay desired family size was higher than the non-Malay desired family size. A similar conclusion was reached in the more recent 1984/85 Malaysian Population and Family Survey, where other things being equal, desired family size was consistently higher for Malay women in all birth cohorts. For example, the mean ideal family size for Malay women in the 1980-84 marriage cohort was 5.1 children per woman, as compared with 3.5 and 3.3 children

per woman for Chinese and Indians, respectively (NPFDB, 1988:112).

Fertility preferences can be measured in a number of ways. The most common and widely available estimate is desired family size which measures a woman's preferred family size, independent of her achieved fertility to date. This measure assumes that a woman is accurately able to assess the costs and benefits of childbearing and is in complete control over her fertility (McClelland, 1983). This measure is biased for several reasons. Some women revise their desired family size upwards, in an effort to rationalize the number of children they already have (Lightbourne, 1985). In some cases women may underreport their desired family size because of unfavorable social, economic or health conditions (Bongaarts, 1990). In some countries, particularly in Africa, where women do not or are unable to provide a numerical response, the average desired family size may be downwardly biased because it excludes non-numerical responses such as, "it is up to God," which is usually regarded as implying preference for a larger family (Jensen, 1985).

Desired fertility can also be measured in response to the question of whether or not a woman wants any more children. This measure of continued childbearing is preferred to the measure of family size preferences because it does not assume that couples are able to quantify their fertility preferences (McCarthy and Oni, 1987). As such it overcomes the problem of

dealing with nonnumeric responses. Although this measure of continued childbearing is relatively unbiased, it is difficult to estimate the fertility implications of these preferences (Bongaarts, 1990).

The demand for children can also be measured by the number of additional children desired. This information is usually obtained for women who respond in the affirmative to the question of "Do you want any (more) children?" This is the least biased of the standard preference measures since it is directed only at those women who want more children. As such it overcomes the problem of rationalizing unwanted births, and voluntarily limiting fertility because of economic, social and health conditions. However, this measure limits one's study sample to the number of "Yes" respondents.

In this research desired fertility will be measured in two ways. Firstly, in terms of data gathered from the question: "Would you personally like to have any (more) children than the number you have now?" The dependent variable in this case is a dichotomy coded Yes=1 and No=0. Secondly, if the respondent answered yes than she was asked "How many (more) children would you like to have?" Total desired fertility is then calculated by adding the total number of living children she already has to the number of additional children that she would like to have. Total desired fertility for women who answered no to the first question, is the number of living children. In the case of women who did not have any

living children, or who had not commenced childbearing, total desired fertility is the number of children wanted at the time of interview.

These two measures of desired fertility overcome some of the measurement problems raised above. If desired fertility is measured in terms of numerical family size desires, then this can only be examined for women who have expressed a numerical desire. However, looking at desired fertility in terms of a nonnumeric response includes all women who were asked this question. The numerical measure of desired family size proposed here incorporates a larger sample of all women who were asked questions on whether they wanted any more children. In the case of the MFLS-I and MFLS-2 New Samples it was applied only to fecund women and as such overcomes the problem of involuntary limitation of fertility due to infecundity. For the Panel Sample however, all women irrespective of their fecundity were included in order to enable comparison between women who had not been exposed to either policy (who had mostly completed their childbearing by the time of the interview in 1988 and were excluded because they were not fecund) and women who had been exposed to the NEP or both the NEP and NPP. Marital status and marital disruption, which constitute important restraints to childbearing, and which could bias fertility desires, were controlled in the preliminary analysis, but were dropped from subsequent

analysis because they were not significant.²³ Finally, because of differences between the various summary indicators of preferred fertility, a combination of methods, will strengthen the validity of the arguments raised in the research hypotheses.

The research hypotheses were tested by comparing the difference in desired fertility expressed by women in MFLS-1 in 1976 and in the MFLS-2 New Sample in 1988, in the first stage for cohorts of women who differ in the exposure to the NEP and NPP. In the second stage the difference between desired fertility in 1976 and 1988 is compared for the Panel Sample to see if the respondents revised their expectations upwards or downwards over this time period.

2. Explanatory Variables

The explanatory variables were divided into eight categories. Their measurement and rationale for inclusion are discussed below.

a) Policies

As pointed out in the review of recent literature, policy effects have been inferred from observation of changes in fertility patterns corresponding to the time when policies, especially the NEP and NPP, were introduced. It is possible to

²³Marital status at the time of interview was coded in terms of currently married (control variable), widowed, divorced, and separated.

examine policy effects in more detail if one is able to trace the changes experienced by the same cohorts of women over time, from before the implementation of a policy to after, and to compare those changes for different population subgroups that are expected to be affected differently by the policies.

Various ways of measuring the policy effect were contemplated in the initial stages of this study. One possibility considered was subdividing the MFLS-1 Sample, the MFLS-2 New Sample, and the Panel Sample into those women who had been exposed to either or both policies, and observing the changes between ethnic groups in each of the subsamples. However this posed a problem. Subdividing an already small sample leaves their analyses and subsequent interpretation questionable. Another possibility was to study completed births before and after each policy was implemented and observe if they varied by ethnic groups. However, such an exercise would entail employing hazard analysis, which is beyond the scope of the present research.

In this research, birth cohort was used as the criteria for measuring policy effect. Policy changes were inferred by looking at the ethnic differences that had occurred in fertility behavior for different birth cohorts distinguished by their exposure to the NEP and NPP. It was hypothesized that women aged more than 39 in 1976 would not have been affected much by either of the policies since they would have mostly

been more than 34 years old and finished with their childbearing before the first policy, the NEP, was introduced in 1971.²⁴ On the other hand, women aged 39 and below in 1976 were aged 34 and below in 1971, when the NEP was introduced, and still had some childbearing years remaining over which to change their fertility behavior (and preferences) in response to the NEP. Since they were interviewed in 1976, they would not yet have felt the impact of the NPP, which was not announced until 1982. Similarly women aged more than 39 years in 1988 would not have been influenced much by the NPP, since it was introduced in 1982 after they had largely completed their childbearing. However, women aged 39 and less would have been exposed to both the NEP and NPP. The analysis included dummy variables for woman's age less than or equal to 39 at the time of each survey to enable comparisons of these birth cohorts with different exposure to the policies. The reference group was women aged more than 39 years old at the time of interview.

The Panel Sample also allowed the observation of the policy effect for the same cohort of women over time. When examining the impact of policies among the women in the Panel Sample in 1976 and 1988, they were divided into three groups

²⁴This is a reasonable assumption to make given that most women who had reached menopause had completed their childbearing by age 35 in the three samples used in this study. In the MFLS-1 Subsample, 86.1 percent of these women had completed their childbearing by the age of 35. This percentage was 91.1 in the MFLS-2 New Sample and 74.2 in the Panel Sample.

according to their exposure to policies. Women aged more than 52 years at the time of interview in 1988 would have been more than 35 years at the time the NEP was introduced in 1972 and thus would have mostly completed their childbearing years and as such were hypothesized as not being affected by policies. Women aged between 40 and 52 years in 1988 would have been more than 35 years when the NPP was introduced in 1982 and as such were hypothesized to have been affected by the NEP alone. The youngest cohort of women, that is, those aged below 40 years in 1988 would have been less than 35 years in 1982 and as such were hypothesized to have been influenced by both the NEP and NPP. Policy effect was gauged by comparing the difference in desired fertility between 1976 and 1988 for each of these three cohorts of women.

This measure of the policy effect should overcome the confounding effects of age, period and cohort. This is because policies affected the different ethnic groups differentially, but it is plausible to assume that the age, period, and cohort effects were fairly homogeneous for the three ethnic groups. Given that the NEP is an ethnic-specific policy, it is reasonable to assume that it would affect the three main ethnic groups differently, and cause their response to the NPP to differ. Since these policies are time dependent, the above approach seemed the most reasonable and straightforward way of observing the policy effect. Age was also entered as a continuous variable, which allowed for the control of the

age/period/cohort effects that affected all ethnic groups in the same way. Since policy is a dummy variable and is ethnic-specific - that is it is turned on for those not exposed to either policy, those exposed to the NEP alone, and those exposed to the NEP and NPP, differentially - while age is a continuous variable which is common to everyone, the problem of multicollinearity does not arise.²⁵

b) Ethnicity

Ethnicity is categorized into Malay, Chinese, or Indian, identifying the three major ethnic groups found in Peninsular Malaysia. A small percentage - about one percent - who identified themselves as "Others" were excluded from this study, since the concern here was to measure ethnic fertility differences between the three principal groups only. The analysis included dummy variables for Chinese and Indians. The reference group is Malays.

c) Religion

In Peninsular Malaysia religion is closely associated with ethnicity, with all Malays being Muslim, most Chinese being Buddhist, Confucianist, or Taoist and most Indians being Hindus. A zero-order correlation in the preliminary stages revealed that religion was indeed highly correlated with ethnicity (0.94 and 0.96 between Buddhism and Chinese, and

²⁵For example, the Pearson Correlation Coefficients between age and policy in the Panel Sample was 0.39, 0.25, and 0.14, between age and, those not exposed to either policy, those exposed to the NEP alone, and those exposed to both the NEP and NPP, respectively.

0.96 between Hinduism and Indians). This variable was therefore dropped in subsequent analysis. Moreover, while MFLS-2 had detailed information on religion, MFLS-2 did not, as such there was no comparable information for religion between these two surveys.

d) Age

Age refers to the age of female respondents and is strongly associated with fertility because it is a measure of the period of exposure to childbearing and socioeconomic changes, as well as possible cohort effects. It is therefore important to include age as a control variable to remove the influence of cohort and differential exposure effects. Age is measured intervally.

e) Socioeconomic Status (SES)

As discussed in Chapter II, socioeconomic status has been cited as an important determinant of fertility differences among the three major ethnic groups in Peninsular Malaysia. As such its inclusion is crucial to this study, especially since the three ethnic groups differ in a number of socioeconomic respects that may affect their fertility. As such my hypotheses can only be confirmed if Malay-nonMalay differences in desired fertility are present after controlling for socioeconomic differences. SES was measured by three variables - education, employment and income.

Education has been found to vary inversely with fertility, however, this relationship has not been supported

by some recent studies of Malay fertility behavior (Malaysia, 1987; Puthucheary et al, 1987), which suggests that other influences, perhaps government policies, may be operating to influence fertility in different ways. In this research female education is included since it is a stronger influencing factor than male education (Cochrane, 1979). Education is measured by the number of years of schooling completed and is classified into primary (1-6 years), and secondary (more than 7 years). The reference group is those who had no education. A dummy variable was created to account for missing values and included in the regression.

Several hypotheses have been forwarded linking employment to fertility, however, the way in which they are related has not always been found to be constant. In most industrialized countries, wives employment is inversely related to the number of children, but in developing countries this relationship has been found to be zero or even positive (Mason and Palan, 1981). This has led to the general conclusion, that modernization, and the subsequent increase in female employment, will ultimately lead to a decline in fertility, as the opportunity cost of children increases. Female employment is therefore an important explanatory variable for fertility and measure of SES. Female employment was measured by looking at work status, whether paid employee, self-employed/own account worker/employer, and unpaid family worker/helper. This variable was measured for women at the time of interview. The

reference category were those unemployed. Preliminary analysis also found a significant correlation between female education and work status. As such in the final analysis only women's education was retained.

Household income is a key indicator of SES. However because of the perennial problem associated with its measurement, comparable data for MFLS-1 and -2 are not yet available. Hence, two separate measures of income are used. For MFLS-1, income refers to "total observable income" as measured by income in cash and kind earned by the household in the 12 months prior to interview (Kusnic and DaVanzo, 1980). For MFLS-2, income refers to total earned household income in cash and kind in the 12 months prior to the interview. Income is measured in Malaysian Ringgit (where one Malaysian Ringgit is equivalent to US\$0.37). For regression purposes the income variable was transformed into its logarithmic form. This was done for two reasons. Income is nonlinearly related to desired fertility - as income rises, desired fertility falls and then levels off. Income is also largely skewed at the upper levels. A dummy variable was created to take account of missing income values and included in the regression. ✓

f) Residence

Most fertility studies have documented rural/urban differentials in fertility, arising from different levels of socioeconomic development. This variable is important in Peninsular Malaysia, since there is substantial rural/urban

segregation by ethnic groups. Malays are more rural, Chinese are more urban, and Indians are fairly equally distributed between rural and urban areas (Malaysia, 1986:134-135). If ethnicity and or its interaction with policies remains significant when residence is controlled, then there is support for the minority group status hypothesis in both rural and urban areas. Residence in the MFLSes is measured according to its population size. Most statistical documents in Malaysia classify urban as those areas having a population of 10,000 and above, and rural as those areas having a population below 10,000. This definition was adopted here to enable uniformity when comparing the results of this research with others.

g) Infant and Child Mortality

Infant and child mortality is seen as an important link to the motivation for childbearing. In the absence of institutional support, parents may view children as old-age security. As such under conditions of high mortality, parents may insure themselves with additional births. Conversely, when mortality is low, parents may view too many children as a barrier to social mobility and place a limit on them. In the case of Malaysia, this demand for children is further complicated by the presence of policies that increase or decrease, as the case may be, the net costs and benefits of children. This variable is measured by the number of children who have died, as stated by female married respondents. A dummy variable was included to take into account missing

values for women who have not begun childbearing and hence would not have experienced infant/child mortality. The reference group is those who have not experienced child/infant mortality.

h. Children Ever Born

The number of children ever born measures the cumulative reproductive outcome of a woman up to the date of interview. While this is usually treated as a dependent variable, in this research this variable was included as a predictor variable when the dependent variable is wantmore (whether a woman wanted any more children). Since the decision to want more children is dependent on the number of children she already has, it is imperative to control for this variable.

Methodology

1. Multiple Regression

The conceptual framework outlined for this research suggests that several factors simultaneously affect the dependent variable, in this case desired fertility. Multiple regression is a method for measuring the effects of several factors concurrently. As such multiple regression will be used to isolate the impact of government policies on ethnic fertility. This statistical tool helps analyze the relationship between a dependent variable and a set of independent or predictor variables. It is used specifically in this study as a prediction equation, a control for other

confounding variables, and a descriptive tool explaining the linkages between the independent and dependent variables. It is also used as an inferential tool to estimate population parameters from the sample observed and to test the hypotheses laid out in this research (Lewis-Beck, 1990; Schroeder et al, 1989).

The Ordinary Least Squares (OLS) method will be used to construct the sample regression function for estimating the population regression function. The general regression is of the form:

$$Y_i = b_0 + b_1X_{i1} + b_2X_{i2} + \dots + b_pX_{ip} + e_i$$

where: X_{ip} = predictor variables
 Y_i = dependent variable
 b_p = parameter or regression coefficient for each predictor
 p = number of predictors
 e_i = random error
 i = 1,.....,n

where the estimated coefficient on any independent variable estimates the effect of that variable while holding the other independent variables constant. The OLS estimate assumes that the relationship between the dependent and independent variables are linear and additive; the random error has zero mean and constant variance (homoscedasticity); the error terms are uncorrelated; and that the sample size has a normal distribution. A few precautions must be observed when using multiple regression. Firstly the dependent variable should not

be highly skewed, especially if it is a dichotomous variable. As such this method is suitable for analyzing desired fertility as measured by the sum of living children and additional children wanted. Secondly, the explanatory/predictor variables should not be highly correlated to each other. When predictors are highly correlated, the estimated regression coefficients tend to be ambiguous and cannot be used to measure the relative contribution of each individual predictor to the dependent variable. When two variables are measuring the same thing, in order to overcome the problem of multicollinearity, one of the variables is often dropped, since little information is lost by doing so (Schroeder et al, 1989). This was done in the case of religion and work status.

2. Logistic Regression

The regression model while placing no restrictions on the values that the independent or exogenous variables take on, assumes that the dependent variable is continuous. As such it is an appropriate method to estimate desired fertility when it is measured as a numeric or quantitative response. However, since the second measure of desired fertility proposed here is a non-numeric measure that dichotomizes respondents into wanting or not wanting more children, a regression model would seriously misestimate the magnitude of the effects of the independent variables on this dependent variable. Although

multiple regression can be used when the dependent variable is dichotomous, the problem of homoscedasticity is minimized only if it can be assumed that the dependent variable is almost exactly divided between the two categories. This assumption did not hold for all cases of the samples used in this research.

Logistic regression is a technically more appropriate method for data analysis when the dependent variable is a dichotomy. The concept underlying logistic regression is the odds ratios - the ratios of the number of events to the number of nonevents. The dependent variable, Y , is assumed to be binary, taking on only two values, 0 and 1. The outcomes on Y are assumed to be mutually exclusive and exhaustive. The research question hinges on the value of the parameter P , the probability that Y equals one or $P=P(Y=1)$. Y is assumed to depend on K observable variables X_k , $k=1, \dots, K$. This relationship is represented as:

$$P = P(Y=1|X_1, \dots, X_K), \text{ or simply}$$

$$P = P(Y|X)$$

where X is the set of K independent variables (Aldrich and Nelson, 1989). While OLS regression assumes that Y and X are linearly related, the logit model²⁶ assumes a nonlinear relationship of the form:

²⁶Log odds are also known as logit, hence the term logit models or logistic regression (Morgan and Teachman, 1988).

$$P(Y=1|X) = \exp(\sum b_k X_k) / [1 + \exp(\sum b_k X_k)]$$

where b is the set of K parameters. As in OLS regression, the data is generated from a random sample of size N , with a sample point denoted by i , $i=1, \dots, N$ with the observations on Y statistically independent of each other. The independent variables may be random or fixed as long as there is no exact or near linear dependence among the X_k s across K .

Logit parameters are typically estimated by Maximum Likelihood Estimation (MLE). While the OLS is concerned with parameter estimates that yield the smallest sum of squared errors in the fit between the model and the data, the MLE is concerned with parameter estimates that yield the highest probability or likelihood of having obtained the observed sample Y . The logit likelihood is given by the equation:

$$\sum_{i=1}^N [Y_i - P(Y_i = 1|X_i, b)] A_i X_{ij} = 0 \quad j=1, \dots, K$$

where: X_{ij} = predictor variables
 Y_i = dependent variable
 b = parameter coefficient for each predictor, and
 $A_i = 1$

The term inside the bracket is the deviation between the observation Y_i and its expected or predicted value. Like the OLS, the properties of MLE are unbiasedness, efficiency and normality. However, because the MLE is nonlinear, it is asymptotic, that is, it improves as sample size increases.

CHAPTER VI

FINDINGS

Guided by the theoretical framework and hypotheses proposed in the previous chapter, I examined how the pattern of ethnic differences in fertility varied over the period from before the implementation of the New Economic Policy in 1971 to after the introduction of the New Population Policy in 1982. I present the findings of the data analysis in this chapter.

The chapter begins with a descriptive analysis of ethnic differences in desired fertility, demographic and socioeconomic characteristics. I examined these differences separately for the MFLS-1 and MFLS-2 New Sample in 1976 and 1988, respectively, and for the group of women in the MFLS-1 who were interviewed in 1976 and 1988, that is, the MFLS-2 Panel Sample. The samples were stratified by ethnicity, since it was hypothesized that the explanatory variables might differ for Malays, Chinese and Indians. This is followed by an examination of the results of the logistic and multiple regressions. Separate logistic and multiple regressions were run for each of the three samples being considered here. The impact of the NEP and NPP on ethnic differences in fertility

was compared before and after controlling for demographic and socioeconomic differences. I conclude this chapter by analyzing the results of the multivariate analyses.

Descriptive Analysis

1. Desired Fertility

a. Want More Children

An analysis of desired fertility as measured by whether women wanted any (more) children, confirmed the presence of ethnic differences (refer to Table 8). For all three samples,

Table 8

Proportion Of Women Who Wanted More Children

Ethnic Group	MFLS-1		MFLS-2 New		Panel Sample		
	1976	N	1988	N	1976	1988	N
Malays	57.9	437	72.8	895	49.2	20.4	465
Chinese	43.5*	317	43.9*	367	29.4*	4.30*	279
Indians	23.5*	81	48.6*	247	12.4*	0.0*	97
Overall N		835		1509			841

*p<0.05

a higher proportion of Malays than nonMalays said they wanted more children. The Malay-nonMalay difference was statistically significant for all three samples. In 1976, 57.9 percent of Malays wanted more children as compared with 43.5 percent Chinese and 23.5 percent Indians, in the MFLS-1. In 1988, all three ethnic groups expressed a greater desire to want more

children. While the change for the Chinese is very slight, there is a 15 percent rise in the proportion for Malays, and a more than twofold increase for Indians. This difference was statistically significant²⁷ for both Indians and Malays. This increase may be due to the fact that women were more likely to delay the beginning of childbearing in the later years. In contrast a comparison of the wantmore variable for the Panel Sample for 1976 and 1988 revealed that for all three ethnic groups there was a statistically significant fall in the proportion of women who wanted more children in 1988 in this cohort of women. Recall that this sample is of a single cohort of women at two points in time, 1976 and 1988. In contrast to

²⁷A 95% confidence interval of the mean and proportion was constructed. The confidence interval is given by:

$\bar{X} \pm 2SE(\text{mean})$ where $SE(\text{mean}) = \text{Standard Deviation}/\sqrt{n}$
for the mean; and
 $p \pm 2SE(p)$ where $SE(p) = \sqrt{p(1-p)/n}$
for the proportion.

For example, to determine whether the difference, in the proportion of Malays who wanted more children, between 1976 and 1988 is significant, the confidence interval was constructed for each year separately and compared. The confidence interval for the proportion who wanted more children in 1976 is $0.58 \pm 2\sqrt{(0.58)(0.42)/437} = 0.58 \pm 0.047$ or (0.53, 0.63) where $n = 437$ and $p=0.58$. Similarly for 1988, given $n=895$ and $p=0.73$, the confidence interval is $0.73 \pm 2\sqrt{(0.73)(0.27)/895} = 0.73 \pm 0.03$ or (0.7, 0.76). Since these two intervals do not overlap, the difference is significant at the .05 level.

the MFLS-1 Sample, the Panel Sample comprised all women, irrespective of their fecundity. Thus the Panel Sample includes women who are much older than the MFLS-1 Sample. The fall in the proportion of women who wanted more children was greatest for Indians. None of the Indian women interviewed in 1988 wanted more children. This was followed by Malays who had reduced their desire to want more children by 85 percent while Chinese women had reduced their preference for more children by 59 percent.

b. Additional Children Wanted

Ethnic differences persist when women were asked to translate their desire for more children into actual numbers. When asked how many more children they wanted, Malays cited the most number of additional children wanted for all three samples (refer to Table 9). Note that these figures include zeros for women who did not want any more children. The Malay-nonMalay difference was again statistically significant for all three samples. For the 1976 MFLS-1 Sample, Malay women wanted on average 1.77 children more per woman, as compared with 0.84 and 0.51 additional children wanted per woman by Chinese and Indians, respectively. While there was a fall in the mean number of additional children wanted by Malay and Chinese women in the MFLS-2 New Sample in 1988, Indians expressed a desire for more additional children. Malays continued to want on average about 0.9 children per woman more

Table 9
Mean Number Of Additional Children Wanted

Ethnic Group	MFLS-1	MFLS-2 New	Panel Sample	
	1976	1988	1976	1988
Malays	1.77	1.63	1.54	0.28
Chinese	0.84*	0.69*	0.53*	0.05*
Indians	0.51*	0.83*	0.70*	0.00*
N	835	1509	841	841

*p<0.05

Note: N for individual cells are as shown in Table 8.

than Chinese, but the Malay-Indian gap in the number of additional children wanted narrowed from 1.25 children per woman in 1976 to 0.8 children per woman in 1988. The difference in the mean number of additional children wanted between 1976 and 1988 was not statistically significant for any of the three ethnic groups.

A look at the Panel Sample of women interviewed in 1976 and 1988, however tells a different story as far as Indians are concerned. In 1976, Malays, Chinese, and Indians wanted on average 1.54, 0.53 and 0.70 additional children per woman, respectively. However, in 1988 there was a considerable decline in the number of additional children wanted by Malays and Chinese. Malays wanted about one and a half children less and Chinese wanted about 0.8 children per woman less in 1988 than in 1976. None of the Indians remaining in the sample of women reinterviewed in 1988, wanted any more children. This difference between 1976 and 1988 for women in the Panel Sample was found to be statistically significant for all three ethnic groups (paired t-test; p<0.001). This decline could presumably

be due to the age effect - since these women were 12 years older in 1988, and would probably have had more children during the interim period, and are therefore less likely to desire more children. This point will be taken up again in the multivariate analysis. The Malay-nonMalay gap in the mean number of additional children wanted has narrowed between 1976 and 1988.

c. Total Desired Fertility

An examination of the second measure of desired fertility, as given by the number of children living at the time of interview plus the number of additional children wanted, confirms the persistence of a statistically significant ethnic difference, with Malays expressing a higher total desired fertility than nonMalays. In 1976, the mean total desired fertility for Malays was found to be 5.47 children per woman, compared with 4.30 children per woman for

Table 10
Mean Total Desired Fertility

Ethnic Group	MFLS-1	MFLS-2 New	Panel Sample	
	1976	1988	1976	1988
Malays	5.47	4.96	5.71	5.74
Chinese	4.30*	3.37*	5.03*	5.19*
Indians	4.22*	3.39*	5.08*	5.36*
N	835	1509	841	841

*p<0.05

Note: Desired fertility=Number of living children + Number of additional children wanted. N for individual cells are as given in Table 8.

Chinese and 4.22 children per woman for Indians in the MFLS-1 (refer to Table 10). Between 1976 and 1988, there was a statistically significant fall in the mean total desired fertility for all three ethnic groups. Malay mean total desired fertility was 4.96 children per woman, as compared with 3.37 and 3.39 children per woman desired by Chinese and Indians in the MFLS-2 New Sample, respectively. The Malay-nonMalay gap in total desired fertility had widened between 1976 and 1988. In 1976, Chinese and Indians desired on average about 1.2 children per woman less than Malays, but in 1988, this difference rose to 1.6 children per woman. Between 1976 and 1988, the mean total desired fertility had increased for all three ethnic groups of women in the Panel Sample. This increase could presumably be partially accounted for by the number of additional children born to these women between 1976 and 1988, given the definition of total desired fertility being adopted in this measure. Malay mean total desired fertility rose slightly from 5.71 children per woman to 5.74 children per woman, Chinese mean total desired fertility rose from 5.03 to 5.19 children per woman, and Indian mean total desired fertility rose from 5.08 to 5.36 children per woman. However, this increase was not found to be statistically significant for any of the three ethnic groups.

As laid out in the conceptual framework, a woman's decision to want more children depends on a number of demographic and socioeconomic factors. I examined the ethnic

differences in these characteristics that could presumably account for the differences in desired fertility as discussed above.

2. Demographic Characteristics

a. Age

Fertility preferences are markedly affected by a woman's age. The older a woman, the less inclined is she to want more children, and the less number of additional children she is likely to desire. This pattern is confirmed for all three ethnic groups in the samples under study, as shown in Tables 11 and 12. An interesting pattern was observed. All three ethnic groups aged 25 - 34 at the time of interview in 1988 in the MFLS-2 New Sample had a higher mean number of additional children desired than their 1976 counterparts. This was also true for all age groups among Indians.

Table 11
Proportion Of Women Who Want More Children
By Agegroup And Ethnicity

	MFLS-1 Sample (1976)				MFLS-2 New Sample (1988)			
	Under 25	25-34	35-49	N	Under 25	25-34	35-49	N
Malays	90.7	57.8	35.3	437	96.8	84.1	42.5	895
Chinese	89.8	50.9	10.5	317	90.3	58.8	13.4	367
Indians	54.6	20.0	0.0	81	74.1	51.5	19.7	247
	Panel Sample 1976				Panel Sample 1988			
	Under 25	25-34	35-49	N	Under 25a	25-34	35-49	N
Malays	90.0	58.4	29.7	465	-	60.0	16.2	465
Chinese	89.3	44.9	6.2	279	-	26.7	3.0	279
Indians	70.0	14.7	0.0	97	-	0.0	0.0	97

Note: a: There were no women under 25 years in the Panel Sample in 1988.

Table 12
Mean Number Of Additional Children Wanted
By Agegroup And Ethnicity

	MFLS-1 Sample (1976)				MFLS-2 New Sample (1988)			
	Under 25	25-34	35-49	N	Under 25	25-34	35-49	N
Malays	2.99	1.52	1.19	437	2.55	1.97	0.63	895
Chinese	2.28	0.84	0.15	317	1.77	0.89	0.17	367
Indians	1.18	0.43	0.0	81	1.43	0.85	0.25	247

	Panel Sample 1976				Panel Sample 1988			
	Under 25	25-35	35-49	N	Under 25a	25-34	35-49	N
Malays	3.14	1.61	0.95	465	-	1.11	0.19	465
Chinese	2.00	0.75	0.09	279	-	0.40	0.30	279
Indians	1.30	0.29	0.0	97	-	0.0	0.0	97

Note: a: There were no women under 25 years in the Panel Sample for 1988.

Table 13
Mean Total Desired Fertility By Agegroup And Ethnicity

	MFLS-1 Sample (1976)				MFLS-2 New Sample (1988)			
	Under 25	25-34	35-49	N	Under 25	25-34	35-49	N
Malays	4.50	4.98	6.67	437	4.05	4.93	5.42	895
Chinese	3.63	3.80	5.38	317	2.90	3.23	3.66	367
Indians	3.00	3.94	5.75	81	2.89	3.41	3.79	247

	Panel Sample 1976				Panel Sample 1988			
	Under 25	25-34	35-49	N	Under 25a	25-34	35-49	N
Malays	4.60	5.11	6.46	465	-	5.58	5.76	465
Chinese	3.61	4.01	6.06	279	-	4.93	5.20	279
Indians	3.40	4.38	5.85	97	-	5.40	5.36	97

Note: a: There were no women under 25 years in the Panel Sample in 1988.

The inverse relationship between desired fertility and age is true only for the two above mentioned measures of additional children desired. When desired fertility is measured by the number of children alive plus the number of additional children desired, that is, total number of desired children, the relationship with respect to age is positive, given the fact that the older a woman the longer she would have been in her childbearing years and hence the more children she is likely to have had between 1976 and 1988. This pattern is seen for all three ethnic groups in the MFLS-1 and MFLS-2 New Samples for 1976 and 1988, respectively (refer to Table 13), and for Malays and Chinese in the Panel Sample in 1976. However, the mean total desired fertility for Indian women in the Panel Sample interviewed in 1988 is slightly lower in the oldest age group than in the middle age group.

The relationship between desired fertility and childbearing is also contingent on the mean age at first marriage. Since children born out of wedlock is not a common occurrence in Malaysia, a woman's exposure to childbearing is strongly related to her marital status and hence her age at marriage. There is a sizeable difference in the mean age at first marriage between the three ethnic groups. Malays tend to marry at a younger age than nonMalays. The mean age at first marriage for Malay women who had married by 1976 was 17.5 years. Indians were on average about a year older at first marriage than Malays, while Chinese were about three and a

half years older than Malays at first marriage. The mean age at first marriage has risen for all three ethnic groups over the 12 year span from 1976 to 1988, with an increase of two and a half years for Malays and 1.3 years for Chinese and 2.4 years for Indians. The mean age at first marriage for Malays, Chinese and Indians, was 20.0, 22.3 and 21.1 years, respectively (refer to Table 14).

b. Children Ever Born

It was observed that the cumulative fertility as measured by the number of children ever born varied by ethnic group, more greatly so in 1988 than in 1976 as shown in Table 14. There was a marked change in the direction of these differences. In 1976, Indians in the MFLS-1 had the highest number of children ever born, at 4.12 children per woman, while Malays had slightly less at 4.07 children per woman. The Chinese had an average of 0.5 children less than Malays. In 1988, there was a fall in the mean number of children ever born for all three ethnic groups, as seen in the MFLS-2 New Sample, with the sharpest decline experienced by Indians - a decline of 1.5 children per woman from the 1976 level to a 1988 level of 2.64. Malays now had the most number of children ever born (3.48 children per woman) with the Chinese intermediate between the two groups (2.75 children per woman).

A similar pattern was discerned among the Panel Sample. Indians had an average of 5.33 children per woman as compared

Table 14
Means Of Socioeconomic And Demographic Characteristics

Characteristics	MFLS-1 Sample (1976)			MFLS-2 New Sample (1988)		
	Malays	Chinese	Indians	Malays	Chinese	Indians
Demographic						
Age at first marriage	17.5	21.0	18.7	20.0	22.3	21.1
Age at first birth	18.1	21.9	20.2	21.3	23.4	22.4
Age at interview	31.1	31.1	30.0	31.6	33.1	29.9
Children ever born	4.07	3.61	4.12	3.48	2.75	2.64
Number of times married	1.40	1.05	1.02	1.09	1.01	1.02
Married at time of of interview (%)	95	97.5	97.5	99.9	100	100
Socioeconomic						
Years of schooling	3.9	4.6	4.6	7.8	7.6	7.1
Income a	5.7	12.8	5.1	10.1	20.9	11.9
Work status (%)						
- paid employee	19.0	25.9	48.1	20.7	28.6	42.1
- self employed	7.3	3.8	1.2	13.4	13.1	4.9
- unpaid family worker	24.7	20.5	2.5	12.4	12.3	4.8
- not employed	49.0	49.8	48.2	53.5	46.0	48.2
Rural (%)	88.1	69.4	72.8	72.1	39.2	69.3
Infant/child mortality	0.37	0.14	0.41	0.15	0.07	0.08
N	437	317	81	895	367	247

Characteristics	Panel Sample 1976			Panel Sample 1988		
	Malays	Chinese	Indians	Malays	Chinese	Indians
Demographic						
Age at first marriage	16.9	20.8	17.9	16.9	20.8	17.9
Age at first birth	18.9	22.1	19.3	18.9	22.1	19.3
Age at interview	34.3	35.0	34.5	46.3	47.1	46.6
Children ever born	4.70	4.71	5.33	6.11	5.41	6.02
Number of times married	1.53	1.01	1.11	1.31	1.02	1.03
Married at time of interview (%)	94.0	96.1	91.8	85.3	89.2	81.4
Socioeconomic						
Years of schooling	2.9	3.2	3.4	3.1	3.4	3.8
Income a	6.1	14.5	7.2	7.7	15.5	9.2
Work status (%)						
- paid employee	18.9	30.5	52.6	13.8	25.1	42.3
- self employed	9.1	5.0	5.1b	24.7	14.7	7.2b
- unpaid family worker	28.6	21.9	3.1b	22.4	9.7	5.1b
- unemployed	43.4	42.6	39.2	39.1	50.5	46.4
Rural (%)	91.4	78.1	73.2	74.4	46.6	49.5
Infant/child mortality	0.53	0.22	0.48	0.65	0.28	0.66
N	465	279	97	465	279	97

Note: a Malaysian ringgit in thousands (one ringgit=US\$0.37)
 b N<20

with 4.70 and 4.71 children per woman for Malays and Chinese, respectively in 1976, but Malay women reinterviewed in 1988 had substantially more children (6.11) than Chinese (5.41) women and slightly more than Indian women (6.02).

c. Marital Stability and Marital Status

There were some differences among the ethnic groups in terms of the number of times married. As shown in Table 14, Malay women had the highest mean number of times married (1.4) in 1976. The difference between Chinese (1.05) and Indians (1.02) is not substantial for the MFLS-1 Sample. Over the years the Malay-nonMalay difference has declined, because of a decrease in the mean number of times married for Malays. In the preliminary analysis this variable was not found to be a significant predictor of ethnic fertility differences and was subsequently dropped from the multivariate and logistic regressions.

Marital status at the time of interview was also examined in the preliminary analysis. Marital status was measured by whether a woman had a husband living with her at the time of interview, as opposed to being widowed, separated, or divorced. It was thought that the likelihood of a woman wanting more children would be greater if a woman was living with her husband at the time of interview. In all but the 1988 Panel Sample, the proportion currently married was very high (>90%). In 1988 women in the Panel Sample (and their husbands)

were 12 years older and as such exposed to a greater risk of widowhood. However, this variable was also found to be not significantly related to desired fertility, and dropped from further analysis.

3. Socioeconomic Characteristics

a. Education

In 1976, Malays had the least number of years of schooling (3.9), while Chinese and Indian women had an average of 4.6 years of schooling each. In 1988 this situation changed dramatically. Mean years of education rose for all three ethnic groups, but the change was greatest for Malays. The NEP was primarily responsible for the great strides Malays made in education. Through the NEP, Malays at both secondary and tertiary levels were assisted by scholarship support, and lower entrance criteria into universities (Jones, 1990). Malays now had the highest number of years of schooling (7.8), followed by Chinese (7.6) and Indians (7.1). The mean years of schooling for the women in the Panel Sample rose slightly between 1976 and 1988 for all three ethnic groups as seen in Table 14. Malays could have been encouraged by the presence of the NEP to further their education. For nonMalays, especially the Chinese higher education in the past had been secondary to business connections in gaining access to the job market. However in the presence of the NEP, which mandated quotas for the employment of Malays, business connections may have lost

their importance to higher education, especially for the Chinese. The mean years of schooling for Malays, Chinese and Indian women in 1988, for this sample was 3.1, 3.4 and 3.8, respectively.

b. Income

A comparison of earned income showed that Chinese continue to be economically better off than Malays and Indians (refer to Table 14). In fact the Chinese were more than twice as well off as Malays or Indians in 1976. In 1988, income rose for all three ethnic groups. However the income disparity between the Chinese and nonChinese did not narrow. While Malay average household income exceeded that for Indians in 1976, the situation was reversed in 1988. However, it is noteworthy to point out that the different measures of income used in these two years may render interyear comparisons difficult to assess. Moreover these measures do not include ownership of assets which rose dramatically for Malays, with the NEP (Liang, 1987). When changes in income level are compared for the same group of women between 1976 and 1988, a different pattern emerged between Malays and Indians. While all three ethnic groups had experienced a rise in their income, the Chinese continue to be far better off than Malays and Indians in 1988, as in 1976. Indian income is slightly higher than Malays income in both 1988 and 1976.

c. Work status

Employment is measured by the respondent's work status at the time of interview. Women's participation in the labor force varies by ethnicity depending on the type of work status. Almost 50 percent of women of all ethnic groups were not working in 1976. This percentage varies slightly in 1988. There is a slight increase in the percentage of Malays not employed in 1988, a small decrease for Chinese and no change at all for Indians. Paid employment for Indians is highest because of their large concentration in the rubber estates. A comparison across the Panel Sample between 1976 and 1988 revealed that there was a 10 percent fall in nonemployment among Malays in 1988, there was a rise in nonemployment among the Chinese and Indians of 19 percent and 18 percent, respectively. Self employment rose for all three ethnic groups, with an approximate three times rise for Malays and Chinese. This could have been because of the NEP which created greater avenues for Malay employment and access to business licenses. The NEP could have encouraged more Malays to seek employment and to set up their own businesses, since it created greater avenues for Malay employment and access to small businesses. However, the increasing difficulty in gaining access to paid employment could have encouraged more Chinese, especially, to venture out on their own. This variable was dropped in the final analysis because it was highly correlated with education.

d. Residence

Place of residence varies markedly by ethnic group. Malays are the most rural of the three ethnic groups, followed by Indians and Chinese. Between 1976 and 1988 all three groups became more urbanized as evidenced in Table 14. However the change for Chinese is most distinct. In 1976 they were 69 percent rural, but in 1988, this proportion dropped to 39 percent. Malays experienced a 16 percentage point drop in rurality, while the change for Indians was about a drop of 3.5 percentage point drop. There was a marked change in place of residence for the Panel Sample between 1976 and 1988. Urbanization was experienced by all three groups, however the nonMalays became much more urbanized in 1988 than Malays. These changes are due both to rural-urban migration and to an urbanization between 1976 and 1988 of areas where respondents lived.

e. Infant/child mortality

There is a substantial difference between the Chinese and the other two groups in child mortality experience. For instance, in 1976, the mean number of infant/child deaths to Malays and Indians was 0.4, while that for Chinese was 0.14 (refer to Table 14). This fell for all three groups in 1988, narrowing the Chinese-Indian gap. Malays continued to experience the highest infant/child deaths although it had declined considerably from the 1976 mean. A comparison of this

mean for the Panel Sample between 1976 and 1988 revealed a normal trend, that is, as women become older, they face a higher risk of experiencing child deaths. However, while the number of child deaths per woman is affected by the number of children ever born, this difference in children ever born accounts for only a small part of the difference in mortality. The mean number of infant/child deaths was substantially higher for Indians (0.66) and Malays (0.65), than for Chinese (0.3). The ethnic difference in mortality rates found here is consistent with the findings of other studies of infant mortality in Peninsular Malaysia, example, DaVanzo and Habicht (1986), and Chak and Ramli (1988).

Summary Of Descriptive Analysis

One can conclude from the above that there was an overall improvement in the economy of Peninsular Malaysia between 1976 and 1988, which affected all three ethnic groups. Furthermore, this resulted in the narrowing of ethnic differentials in socioeconomic characteristics, perhaps due to the NEP. However, Chinese continue to be economically better off than Malays and Indians.

As summarized in Table 15, the socioeconomic characteristics examined above for the most part relate to the three measures of desired fertility employed in this research in a manner consistent with the modernization theory of fertility behavior - namely that the more modern a society,

Table 15

Bivariate Analysis Of Desired Fertility And Socioeconomic Variables

	Mean Desired Fertility				Mean Number Of Additional Children Desired				Proportion Wanting More Children			
	MFLS-1		MFLS-2		MFLS-1		MFLS-2		MFLS-1		MFLS-2	
	1976	1988	1976	1988	1976	1988	1976	1988	1976	1988	1976	1988
Education												
No Education	5.89	5.17	6.09	5.97	0.97	0.83	0.74	0.09	64.80	52.90	25.90	6.70
Primary	4.82	4.61	5.20	5.38	1.36	0.92	1.20	0.22	48.40	46.30	43.60	17.00
Secondary	3.54	3.91	3.97	4.21	1.58	1.64	1.49	0.29	36.50	28.60	57.80	17.90
Income												
Under \$5000	4.99	4.83	5.33	5.46	1.42	1.19	1.20	0.24	51.60	61.80	42.30	16.20
\$5001-\$10000	5.14	4.60	5.73	5.58	1.25	1.46	0.96	0.16	48.20	67.10	34.70	13.50
Above \$10000	4.43	3.83	5.20	5.52	0.97	1.17	0.77	0.12	42.30	57.80	32.10	8.70
Work Status												
Paid Employee	4.80	3.77	5.29	5.24	1.19	1.27	0.81	0.14	46.60	62.40	30.80	16.00*
Self Employed	5.96	4.67	5.97	5.26	1.73	1.01	1.21	0.24	46.70	51.70	34.40*	17.80
Unpaid	5.17	4.87	5.41	5.61	1.51	0.99	1.29	0.20	53.70	56.50	45.70	10.90
Not Employed	4.72	4.39	5.39	5.73	1.20	1.39	1.05	0.15	48.70	65.10	39.80	10.40
Stratum												
Urban	3.90	3.82	4.72	5.28	0.88	1.03	0.65	0.15	43.90	57.20	32.30	10.40
Rural	5.16	4.62	5.53	5.65	1.40	1.42	1.13	0.19	50.50	65.00	39.50	14.10
Infant/child Mortality												
0	4.62	4.22	5.05	5.23	1.35	1.33	1.18	0.21	47.70	36.00	43.20	14.80
1	5.92	4.85	6.45	5.99	1.17	0.74	0.87	0.14	61.40	56.30	29.50	10.50
2	6.09	6.82	6.08	6.16	0.59	0.55	0.39	0.03	76.50	63.60*	15.70	5.90
3	6.36*	5.60*	6.57	6.68	1.29*	0.00*	0.62	0.04	50.00*	100.00*	23.80	4.00
4+	8.75*	-	6.40	5.58	0.25	-	0.50	0.08	75.00	-	20.00	8.30
N	835	1509	841	841	835	1509	841	841	835	1509	841	841

Note: Values have been adjusted to reflect oversampling of Indians in MFLS-2

* N = less than 20

the less the desire for high fertility. For example, the desire for more children, the number of additional children wanted, and desired fertility are all negatively correlated with education, urbanization, and income. On the other hand, all three measures of desired fertility in most cases are positively correlated with infant/child mortality. The bivariate analysis between these measures of desired fertility and a woman's work status however, showed somewhat mixed results. While desired fertility in all three cases was for the most part higher for those not employed, the self employed and unpaid workers, than for paid employees, there is no consistent pattern between self-employed and unpaid work status.

From the foregoing analysis, it is clear that there are ethnic differences in desired fertility and that these differences could possibly be due to the confounding effects of socioeconomic and demographic differences. On the other hand, these characteristics differences may not be strong enough to explain the ethnic differences in fertility. Conclusive evidence about the strength and direction of this relationship can be drawn from the more rigorous regression analysis, which I now turn to. If ethnic differences persist when background characteristics are controlled, then there is evidence to suggest that ethnicity exerts an independent effect on fertility behavior. Furthermore, since my argument about the strength of the ethnic factor hinges on the

differential impact of government policies - the NEP and NPP to be more specific - a significant and negative independent impact of ethnicity and/or its interaction with policies would validate the argument that policies have exacerbated minority insecurities and caused minorities to limit their fertility desires more than before their implementation.

Multivariate Analysis

1. Logistic regression

The dichotomous relationship between a woman's decision to want more children (coded Yes=1 and No=0) and various predictor variables was analyzed using logistic regression. This relationship was examined for the 835 women in the MFLS-1 Sample and the 1,509 women in the MFLS-2 New Sample. Recall that these samples were restricted to fecund women. A logistic regression for the Panel Sample was not carried out. This is because about 67 percent of this Sample consisted of women who had completed their fertility by the time of the interview in 1988, and as such did not desire more children. Subdividing the remaining women who desired more children in 1988 into cohorts differentially exposed to policies, resulted in a number of empty cells, especially since in 1988, the number of Chinese and Indians who wanted more children was very small - 12 and 0, respectively. Thus although a logistic regression was possible for 1976, a comparison of changes between 1976 and 1988 was not. Probability estimates were obtained for two

Table 16
Logistic Regression
Determinants Of Probability Of Wanting More Children
MFLS-1 And MFLS-2 New Samples

Explanatory Variables	MFLS-1 Sample 1976		MFLS-2 New Sample 1988	
	Model 1	Model 2	Model 1	Model 2
Ethnicity (rc=Malay)				
Chinese	-0.974**	-0.728**	-1.341**	-2.048***
Indian	a	a	-0.648	-1.382**
Policies				
NEP (rc=no policy)	1.406***	-0.974**		
NEP and NPP (rc=NEP alone)			2.554***	0.421*
Interactions				
Chinese*NEP	0.839**	-1.890***		
Indian*NEP	-0.128	-3.331***		
Chinese*NEP and NPP			-0.003	-0.109
Indians*NEP and NPP			-0.738	-1.167
Age		-0.139***		-0.151***
Children ever born		-0.416***		-0.609***
Education (rc=no schooling)				
Primary		0.079		-0.129
Secondary		-0.172		-0.330*
Income (in logarithmic form)		-0.068		-0.055
Stratum (rc=urban)				
Rural		0.393*		0.259*
Log of likelihood function	-538.27	-390.23	-843.99	-621.34
Number of observations	835	835	1509	1509

Note: *p<0.10 **p<0.05 ***p<0.001 for two-tailed test; rc=reference category
a: All Indians not exposed to the NEP in 1976 did not want any more children.

types of models - Model 1 when socioeconomic and demographic variables were not controlled and Model 2 when socioeconomic and background variables were controlled. The strength of the explanatory variables for the MFLS-1 Sample of 1976 and the MFLS-2 New Sample of 1988 are summarized in Table 16.

Ethnicity by itself, and when interacted with NEP, is a significant predictor of the probability of wanting more children in 1976, in the absence of socioeconomic and demographic controls. The direction of the relationship between desired fertility and ethnicity differs between Malays and nonMalays and between those exposed and not exposed to the NEP. Chinese are significantly less likely to want more children than Malays in the absence of the NEP (-0.974) when socioeconomic and demographic variables were not controlled.²⁸

²⁸The Chinese coefficient by itself predicts the probability of wanting more children when compared with Malays (the reference group) in the absence of the NEP. Similarly the Indian coefficient by itself shows Indian-Malay differences in the probability of wanting more children, in the absence of the NEP. For the younger birth cohort (which was hypothesized to be influenced by the NEP), the Chinese-Malay differential is the sum of the coefficients of Chinese and of the Chinese and NEP interaction, and similarly the Indian-Malay difference is the sum of the Indian coefficient and the coefficient of the interaction of Indian and NEP. The NEP coefficient by itself is the likelihood of Malays, exposed to the NEP, wanting more children, in relation to Malays not exposed to the NEP. To assess the effects of the policies on each of the other two ethnic groups, one must add the NEP coefficient to the coefficient of the interactions of NEP with Chinese or Indian ethnicity. In the same manner, in 1988 the NEP and NPP variable explains the probability of Malays exposed to these policies wanting more children when compared with Malays exposed to the NEP alone. To obtain the impact of the NPP on nonMalays, this coefficient has to be added to the coefficient of the interaction of Chinese or Indian with both policies.

A similar comparison for Indians was not available because all Indians not exposed to the NEP in 1976 did not want any more children. Malays exposed to the NEP are significantly more likely to want more children than their counterparts not exposed to the NEP. A similar pattern emerges between Chinese exposed to the NEP and those not exposed to the NEP. However Chinese women exposed to the NEP are significantly more likely to want more children than Malays ($1.406 + 0.839 = 2.245$). Indian women exposed to the NEP, though also more likely to want more children than Malays exposed to the NEP, have the lowest desire for children among the three ethnic groups ($1.406 - 0.128 = 1.278$). The reason why women exposed to the NEP are more likely to want more children than women not exposed to any policy, is because these women are younger and are more likely to have fewer children and hence to want more children.

When age and children ever born is controlled, this relationship changes dramatically. When socioeconomic and demographic controls are added into the model, the likelihood of Chinese not exposed to the NEP wanting more children continues to be negative as compared with Malays not exposed to the NEP. However, all three ethnic groups exposed to the NEP are significantly less likely to want more children than their counterparts who have not been exposed to the NEP. Thus in 1976, when age, children ever born and socioeconomic differences are controlled, the NEP has a significant negative

effect on all three ethnic groups. However, when background characteristics are controlled, the significance of the negative relationship is much stronger for Chinese and Indians exposed to the NEP (-2.9 and -4.3, respectively) than for Malays (-0.97).

The model for 1988 allowed a comparison between cohorts exposed to the NEP and cohorts exposed to both the NEP and NPP. In 1988 when background characteristics are not controlled Chinese and Indians exposed to the NEP were less likely to want more children than Malays exposed to the NEP. This relationship is significant for Chinese but not for Indians. As in 1976 all three ethnic groups in the younger cohort exposed to both policies were more likely to want more children than their counterparts in the older cohort exposed to the NEP alone. This coefficient for Malays, Chinese and Indians was 2.554, 2.551 and 1.836, respectively. Again this is presumably because the former cohort being younger had less children and as such were more likely to want more children than the latter cohort. However the strength of this relationship is stronger for Malays and Chinese than for Indians.

When background variables are controlled this situation changes significantly for all three ethnic groups. Chinese and Indians exposed to the NEP alone are significantly less likely to want more children than Malays exposed to the NEP alone. The strength of this relationship becomes much stronger when

background variables are controlled. It increases from -1.341 to -2.048 for Chinese and from -0.648 to -1.382 for Indians. When age, children ever born and socioeconomic factors are controlled, the strength of the probability of wanting more children for Malays in the younger cohort exposed to both policies, though still positive, is greatly reduced from 2.554 to 0.421. On the other hand the strength of this relationship for nonMalays continued to be positive for Chinese ($0.421 - 0.109 = 0.312$), but became negative for Indians ($0.421 - 1.167 = -0.746$), increased in strength between 1976 and 1988, but remained non significant for both Chinese and Indians. Thus in 1988, the NEP remained a significant predictor of the probability of wanting more children for nonMalays, when background variables are controlled. NonMalays were significantly less likely than Malays to want more children in the presence of the NEP. When the NPP is introduced into the model, it is positively related to the probability of wanting more children for Malays and Chinese but negatively related with the probability for Indians. However, while the relationship for Malays was significant ($p < 0.10$) it was not significant for both Chinese and Indians.

Based on the above regressions I summarize the statistically significant effect of policies on the three ethnic groups. Malays were more likely to want more children than Chinese in the absence of any policies (there were no observations for Indians). All three ethnic groups exposed to

the NEP in 1976 were less likely to want more children. In the long run, 1988, the NEP had a positive impact on Malays but a negative impact on Chinese and Indians. The NPP had a significant positive impact on Malays in 1988.

Translated into odds ratio²⁹ these results can be interpreted as follows. In 1976, Chinese were 0.5 times as likely as Malays to want more children when they were not exposed to the NEP (refer to Table 17). This ratio decreases even further for Chinese women exposed to the NEP (0.06). Similarly Indians exposed to the NEP were 0.01 times less likely to want more children than Malay women not exposed to the NEP. Malay women exposed to the NEP were 0.38 times as likely to want more children than their counterparts not exposed to the NEP. In 1988, Chinese and Indian women exposed to the NEP alone were 0.13 times and 0.25 times as likely to want more children, respectively, than Malays in the same group. On the other hand Malay and Chinese women were 1.52 times and 1.37 times as likely to want more children than the reference group. Indians exposed to both policies, however, were only 0.47 times as likely to want more children than Malays exposed to the NEP alone.

²⁹The odds ratio is the exponent of the coefficient of the regression estimates, and takes a value between zero and infinity. The reference group always has an odds ratio of one. All other groups are compared on the basis of the reference group. An odds ratio of less than one implies a lower probability than that for the reference group. Similarly, an odds ratio greater than one implies a higher probability than that for the reference group.

Table 17
Odds Ratio Of Wanting More Children
MFLS-1 And MFLS-2 New Samples

Ethnic Group	1976		1988	
	No policy	NEP	NEP	NEP and NPP
Malay	1	0.38	1	1.52
Chinese	0.48	0.06	0.13	1.37
Indians	-	0.01	0.25	0.47

Note: Ratios based on regression estimates from Table 16.

Of the demographic variables, age at interview and children ever born were significantly negatively correlated with the desire for more children. Among the socioeconomic variables, secondary education was negatively related to the desire for more children, while rurality was positively related to the desire for more children. This is consistent with the findings in the bivariate analysis. An interaction of rurality with ethnicity did not have a significant coefficient. Child mortality and women's work status were found to be not significant and were dropped from the final analysis to achieve a parsimonious model.

2. Multiple Regression

The relationship between total desired fertility (number of additional children wanted + number alive) and the various predictor variables discussed earlier is analyzed using ordinary least squares multiple regression. As in the logistic regression, separate models were constructed, one when

Table 18
OLS Regression Estimates Of Total Desired Fertility
MFLS-1 And MFLS-2 New Samples

Explanatory Variables	MFLS-1 Sample 1976		MFLS-2 New Sample 1988	
	Model 1	Model 2	Model 1	Model 2
Ethnicity (rc=Malay)				
Chinese	0.053	0.246	-1.470***	-1.058***
Indian	-0.217	0.197	-0.751*	-0.475
Policies				
NEP (rc=no policy)	-1.223***	0.436*		
NEP and NPP (rc=NEP alone)			-0.750***	0.189*
Interactions				
Chinese*NEP	-1.163***	-1.251***		
Indian*NEP	-0.401	-0.712*		
Chinese*NEP and NPP			-0.180	-0.468*
Indians*NEP and NPP			-0.806*	-1.033*
Age		0.090***		0.048***
Education (rc=no schooling)				
Primary		-0.330**		-0.291*
Secondary		-1.202***		-0.771***
Income (in logarithmic form)		0.151**		-0.138*
Stratum (rc=urban)				
Rural		0.901***		0.339***
Adjusted R ²	0.13	0.22	0.19	0.25
Number of observations	835	835	1509	1509

Note: *p<0.10 **p<0.05 ***p<0.001 for two-tailed test; rc=reference category.

socioeconomic and demographic variables were not controlled and one when these were controlled. Separate regressions were run for 1976 and 1988. I summarize the results in Tables 18 for the 1976 MFLS-1 Sample and the 1988 MFLS-2 New Sample.

In 1976, Malay women in the oldest birth cohort (aged more than 39 in 1976 and hypothesized to have completed their childbearing before the introduction of the NEP) desired fewer total children than Chinese women but more children than Indian women, when the influence of socioeconomic and demographic variables were not controlled as shown in Table 20. Chinese women wanted about 0.05 children more, and Indian women wanted 0.2 children less than Malay women. These differences were not statistically significant. However, under the influence of the NEP (which we infer by looking at the younger birth cohort of women aged 39 and below in 1976), there is a decline in desired fertility for all ethnic groups, with Malays, Chinese, and Indians wanting 1.22, 2.38 ($1.22 + 1.16$) and 1.62 ($1.22 + 0.4$) children less, respectively, than their counterparts not exposed to any policies.

Income, education, residence and age were found to be significant predictors of desired fertility in 1976 and therefore it was important to control for ethnic differences in these background variables to assess the independent influence of ethnicity and policies. When these variables are controlled, Chinese and Indian women in the older cohort prefer even more children in 1976 - than Malays, before the

NEP - compared with what was seen when these variables were not controlled. When NEP is introduced, there is a statistically significant drop in nonMalay fertility, with Chinese and Indians now wanting 0.8 (0.436-1.251) and 0.3 (0.436-0.712) children less, respectively than Malays. On the other hand, Malays want 0.4 children more with the NEP. This change is also significant for the Malays.

The OLS estimates for 1988 show the impact of the NEP and NPP in relation to the NEP alone. In 1988 the NEP exerted a negative influence on desired fertility for Chinese and Indian women, when SES and demographic variables were not controlled. Chinese and Indians interviewed in 1988 and exposed to the NEP alone desired 1.5 and 0.7 children less than Malays. In relation to the NEP, the combination of both policies had a greater negative impact on Indians than Chinese, with Indians and Chinese wanting about 1.6 and 0.9 children less than Malays. With the introduction of the NPP (compared with NEP alone), Malay desired fertility also declined, with Malays wanting 0.7 children less.

When education, income, residence and age were controlled, the NEP had a reduced impact on the Chinese and Indians vis-a-vis the Malays. Chinese and Indians now desired 1.1 and 0.5 children less than Malays, respectively. Similarly when the NPP is introduced, controlling for the background characteristic differences reduces the impact of both policies on Chinese and Indian desired fertility to 0.3 and 0.8

children less, respectively, than for Malays. Malays on the other hand, increased their desired fertility size by 0.2 children per woman. The influence of the NPP was found to be statistically significant for all three ethnic groups. While the NEP had a statistically significant negative impact on Chinese and Indians in the short-run, this was true in the long-run for the Chinese only. The impact of the NEP on Malays was significantly positive in both the short and long term.

The above analysis was based on two separate, though comparable, groups of women. a more poignant test of the impact of the NEP and NPP was afforded when changes in desired fertility were traced over time for the same group of 841 women in the Panel Sample of MFLS-1 women who were interviewed in 1976 and reinterviewed in 1988 and which included older women who had completed their childbearing in 1988. This sample allowed the comparison between three groups of women - those not exposed to any policies (aged more than 52 years at the time of interview in 1988), those exposed to the NEP alone (aged 40-52 in 1988), and those exposed to both policies (aged below 40 in 1988). These changes were observed for each group of women between 1976 and 1988, as summarized in the regression estimates in Table 19.

In 1976 Chinese in the oldest birth cohort desired more children than Malay women - 0.39 children more - when background characteristic differences were not controlled. On the other hand, Indians not exposed to either policy desired

0.30 children less than Malays in the same category. However, all three ethnic groups exposed to the NEP desired fewer children, with Malays, Chinese and Indians wanting 0.48, 2.23 ($0.48 + 1.75$), and 0.89 ($0.47 + 0.42$) children less, respectively, than their counterparts not exposed to any policies. This difference becomes even greater for all three ethnic groups exposed to both policies. Malays exposed to both policies desired 1.76 children less than their counterparts not exposed to either policy. Similarly, Chinese and Indians desired 3.12 ($1.76 + 1.36$) and 2.47 ($1.764 + 0.704$) children less than their counterparts not exposed to either policy, when background variables were not controlled. These significantly large differences could be explained by the fact that women exposed to both policies were younger women and as such would not have had many children and therefore would desire many more children than women in the older cohort not exposed to either policy and who would have largely completed their childbearing by the time of the interview in 1976 and as such would not desire any more children.

When background variables were controlled, both Chinese and Indian women not exposed to the NEP or NPP desired more children than Malay women in the same group, though this is statistically significant only for the Chinese. Chinese women desired 0.7 children more than Malay women, while Indian women desired 0.23 children more than Malay women. However this

Table 19
OLS Regression Estimates Of Total Desired Fertility
Panel Sample 1976 And 1988

Explanatory Variables	Panel Sample 1976		Panel Sample 1988	
	Model 1	Model 2	Model 1	Model 2
Ethnicity (rc=Malay)				
Chinese	0.389	0.729**	1.058**	0.197**
Indian	-0.298	0.226	0.283	0.236
Policies (rc=no policy)				
NEP	-0.476*	0.563*	0.247	0.676*
NEP and NPP	-1.764***	0.389	-0.146	0.947*
Interactions				
Chinese*NEP	-1.753***	-1.787***	-2.241***	-2.052***
Indian*NEP	-0.417	-0.735*	-0.938*	-0.973*
Chinese*NEP and NPP	-1.357**	-1.784***	-2.449***	-2.623***
Indian*NEP and NPP	-0.704	-1.375**	-0.751	-2.102*
Age		0.066**		0.024*
Education (rc=no schooling)				
Primary		-0.243*		-0.342*
Secondary		-1.154***		-1.588***
Income (in logarithmic form)		0.120*		0.336***
Stratum (rc=urban)				
Rural		0.496**		0.159
Infant/child mortality (rc=no infant/child deaths)		0.622**		ns
Adjusted R²	0.14	0.18	0.07	0.13
Number of observations	841	841	841	841

Note: *p<0.10 **p<0.05 ***p<0.001 for two-tailed test; rc=reference category. ns=not significant.

relationship reverses for women exposed to policies. Malay women influenced by the NEP alone desired 0.56 children more than their counterparts not exposed to either policy. This was statistically significant. On the other hand, Chinese and Indian women exposed to the NEP alone desired fewer children, 1.22 and 0.17 children than their counterparts not influenced by either policy. This was statistically significant for both Chinese and Indians. A similar pattern was observed for the youngest cohort of women, which was exposed to both policies. Chinese and Indian women in this cohort desired fewer children than Malay women in the same cohort. The t-statistic showed statistical significance for both Chinese and Indians in this group. Furthermore, while Malay women influenced by both policies wanted 0.39 children more than Malay women not exposed to either policy, Chinese and Indian women wanted 1.39, and 0.99 children less than their counterparts not exposed to either policy. In other words, while the NPP had a negative influence on nonMalay women exposed to it, it had a positive influence on Malay women exposed to it. Similarly, Malay women exposed to both policies reacted positively with respect to desired fertility, while nonMalay women exposed to both policies continued to react negatively. However, the positive influence of the NEP for Malays was greater than the positive influence of both policies. Similarly, the negative influence of the NEP was stronger than the negative influence of both policies for nonMalays. In other words the NEP had a

stronger positive influence on Malays and a stronger negative influence on nonMalays than the NPP. An almost similar pattern was found for 1988.

In 1988, Chinese and Indians in the older birth cohort not exposed to either policy desired 1.06 and 0.28 children more than Malays, when socioeconomic and demographic variables are not controlled. These results were statistically significant for the Chinese. In the cohort exposed to the NEP alone, Malay women wanted more children and nonMalay women wanted less children than their counterparts in the oldest cohort, with Malays wanting 0.25 children more and Chinese and Indians wanting 1.99 and 0.69 children less. These results were statistically significant for nonMalays. However, all three ethnic groups in the youngest cohort wanted less children than their counterparts in the oldest cohort. Malay women in the cohort exposed to both policies wanted 0.15 children less than those not exposed to policies, while Chinese women wanted 2.60 children less, and Indian women wanted 0.90 children less than their counterparts in the oldest cohort. However, these results were statistically significant for only the Chinese.

When controlling for socioeconomic and demographic differences (age and education were found to be significant predictors of desired fertility; age was positively related to desired fertility, and education negatively related, confirming the findings of the bivariate relationship), a

somewhat similar pattern emerges as before. The older cohort of nonMalay women continue to desire more children than Malay women. However the t-statistic was significant only for Chinese. While Malay women in the second cohort, exposed to the NEP alone, wanted 0.68 children more than their pre-NEP counterparts, Chinese and Indian women in this group wanted 1.38 and 0.30 children less than their counterparts not exposed to policies. These effects were statistically significant for all three ethnic groups. The influence of both policies was much stronger on all three ethnic groups than the influence of the NEP alone. Controlling for socioeconomic variables, it was found that Malay women in the youngest cohort desired more children (0.95) than women not exposed to either policy, while Chinese and Indian women in the same cohort desired less children than their counterparts in the oldest cohort (1.68 and 1.15, respectively). Once again these results were statistically significant for all three ethnic groups. To summarize, when socioeconomic and demographic variables are controlled, nonMalays in the Panel Sample desired more children than Malays in the absence of any policies, but fewer children in the presence of policies, than Malays. These differences were statistically significant. While in both the short run (1976) and in the long run (1988), the NEP by itself and in the presence of the NPP had significantly negative effects for nonMalays, it was positive for Malays.

A separate regression for the Panel Sample, with the change in total desired fertility between 1976 and 1988 as the dependent variable, produced some very interesting results (see Table 20). Chinese and Indians in the oldest birth cohort, that is those not exposed to either policies, desired more additional children than their Malay counterparts, when socioeconomic and demographic differences were controlled, as was found in the two separate regressions for 1976 and 1988. Interestingly enough Malay women in the middle cohort - those exposed to the NEP alone who were aged between 40 and 52 in 1988 - did not desire any more additional children than their counterparts not exposed to either policy. This could be because these women had completed most of their childbearing before the positive effects of the NEP were felt and as such the short term effects of the NEP did not encourage them to change their total desired fertility. Note however that this difference was not statistically significant. On the other hand there was a statistically significant fall in the additional number of children desired between 1976 and 1988 among Chinese women exposed to the NEP alone as compared with their counterparts not exposed to either policy. Similarly Indians exposed to the NEP experienced a fall in the additional number of children desired as compared to their counterparts not exposed to either policy, but this fall was not significant. Chinese and Indian women in the former cohort desired 0.49 and 0.43 children less than their counterparts

Table 20
Change In Total Desired Fertility Between 1976 and 1988
Panel Sample

Explanatory Variables	Model 1	Model 2
Ethnicity (rc=Malay)		
Chinese	0.669**	0.633*
Indian	0.582*	0.489
Policies (rc=no policy)		
NEP	0.723***	-0.003
NEP and NPP	1.618***	0.243*
Interactions		
Chinese*NEP	-0.489*	-0.486*
Indian*NEP	-0.521	-0.430
Chinese*NEP and NPP	-1.092**	-1.016**
Indians*NEP and NPP	-0.847*	-0.842*
Age		-0.064***
Education (rc=no schooling)		
Primary		0.086
Secondary		0.114
Income (in logarithmic form)		-0.038
Stratum (rc=urban)		
Rural		0.065
Infant/child Mortality (rc=no infant/child deaths)		0.058
Adjusted R²	0.07	0.10
Number of observations	841	841

Note: *p<0.10 **p<0.05 ***p<0.001 for two-tailed test; rc=reference category.

in the latter cohort. Even though it may have been too early for nonMalays to have felt the negative impact of the NEP, its very presence could have exacerbated their insecurities. The Malay-nonMalay difference in additional number of children desired becomes even more pronounced when the youngest cohort of women - those exposed to both policies - were compared. Malay women exposed to both policies wanted an additional 0.24 children more in 1988 than in 1976. On the other hand, Chinese and Indian women exposed to both policies continued to curtail their total desired fertility between 1976 and 1988 by 0.77 and 0.69 children, when compared with their counterparts not exposed to either policy. Note that these changes occurred when age, infant/child mortality and socioeconomic characteristic differences were controlled and they were statistically significant for all three ethnic groups. Given the fact that these women were much younger, they would have had a longer time of exposure to the NEP and would have had enough years of childbearing left in which to change their fertility desires. These results reaffirm estimates obtained in the earlier separate regressions of the Panel Sample, and also point to the fact that total desired fertility increased for Malays even when infant/child mortality was controlled. These results also confirmed that the long term effects of the NEP for Malays did encourage them to take advantage of the pronatalistic incentives of the NPP. NonMalays reacted to the

NEP even in the short term and were discouraged from taking advantage of the NPP in the long run.

Discussion

From the regression estimates, the adjusted mean desired fertility was calculated for all three samples.³⁰ This controlled for differences in socioeconomic and demographic factors across the various ethnic and policy subgroups. When neither the NEP or NPP is present, Malays in the MFLS-1 Sample desire fewer children than Chinese or Indians, as shown in Table 21. The mean desired fertility for Malays not exposed

Table 21
Adjusted Mean Desired Fertility MFLS-1 And MFLS-2 New Samples

	No Policy	NEP(1976)	% Change	NEP(1988)	NEP&NPP	% Change
Malays	5.13	5.17	+8	4.81	5.00	+4
Chinese	5.38	4.57	-14	3.75	3.47	-7
Indians	5.33	5.06	-5	4.33	3.50	-19
Malay-Chinese Difference (%)	-5	+12		+22	+31	
Malay-Indian Difference (%)	-4	+2		+10	+30	

Note: The adjusted mean desired fertility was derived from the coefficients in columns 2 and 4 in Table 18.

³⁰The adjusted mean desired fertility is given by the formula:

$$Y = a + b_1X_1 + b_2X_2 + \dots b_nX_n$$

where Y = dependent variable
a = intercept
 X_i = mean for variable X_i
 b_i = parameter estimates of predictor variable X_i

to these two policies is 5.1 children per woman, compared with Chinese (5.4) and Indians (5.3) in the same sample. The reverse is true for Malay women interviewed in 1976 who were exposed to the NEP. They had a higher mean desired fertility of 5.2 children per woman than Chinese (4.6) or Indians (5.1). This result is consistent with research hypothesis one. Similarly, Malay women exposed to both policies had a higher mean desired fertility of 5 children per woman than their counterparts who were exposed to the influence of the NEP alone, whose mean desired fertility was 4.8 children per woman. This evidence supports research hypothesis two. On the other hand, Chinese and Indian women in the same sample, interviewed in 1988 and exposed to both policies had a lower mean desired fertility than their counterparts exposed to the NEP alone. In 1988, Chinese and Indians in the former group had 3.7 and 4.3 children per woman respectively, while Chinese and Indians in the latter group had about 3.5 children per woman each. While the fall in desired fertility as a consequence of the NEP was stronger for the Chinese, the fall in desired fertility as a consequence of the NPP was stronger for Indians.

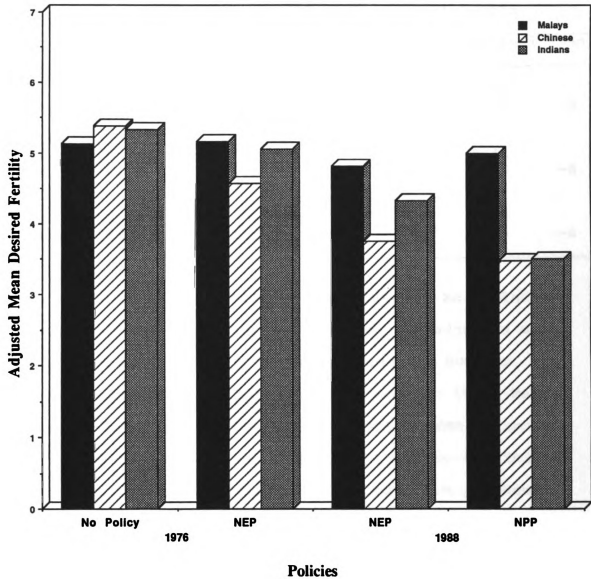
Over the span of 12 years, between 1976 and 1988, the mean desired fertility fell for all three ethnic groups, as a consequence of rapid socioeconomic development in the country as a whole. However the ethnic differences in fertility desires persisted. While Chinese and Indians have continued to

revise their family size expectations downwards, Malays have revised their expectations upwards. The mean desired fertility for the Malay cohort exposed to the NEP in 1976 was 8 percent higher than for their counterparts not exposed to either policy. Similarly the mean desired fertility of Malays exposed to both policies in 1988 was 4 percent more than for their counterparts exposed to the NEP alone. Conversely the mean desired fertility for Chinese and Indians exposed to the NEP alone in 1976 was lower by 14 percent and 5 percent, respectively than for their counterparts not exposed to either policy, while Chinese and Indians exposed to both policies in 1988 had a mean desired fertility that was 7 percent and 1 percent lower than their counterparts exposed to the NEP alone. Between 1976 and 1988, from before the implementation of the NEP, to after the implementation of the NPP, the Malay-nonMalay gap had widened tremendously with the Malay-Chinese gap in mean desired fertility increasing from -5 percent to 31 percent and the Malay-Indian gap increasing from -4 percent to 30 percent (refer to Figure 6). These results support hypothesis three. These differences were found to be significant irrespective of place of residence, in line with hypothesis four.

A comparison of the same group of women between 1976 and 1988 in the Panel Sample, reaffirms these findings (refer to Table 22). The adjusted mean desired fertility for Malays not exposed to either policy is lower than for Chinese and

Figure 6

**Adjusted Mean Desired Fertility
MFLS-1 And MFLS-2 New Samples**



Indians. In 1976 Malay women in this group wanted 5.28 children per woman as compared with 6.01 and 5.51 children per woman for Chinese and Indians, respectively. While the Malay-

Table 22
Adjusted Mean Desired Fertility Panel Sample

	Malays	% Change	Chinese	% Change	Indians	% Change
No policies						
1976	5.28		6.01		5.51	
1988	5.09	-4	6.01	0	5.32	-3
NEP Alone						
1976	5.84		4.06		5.11	
1988	5.77	-1	3.71	-9	4.79	-6
NEP and NPP						
1976	5.67		3.89		4.29	
1988	6.04	+6	3.41	-12	3.93	-8

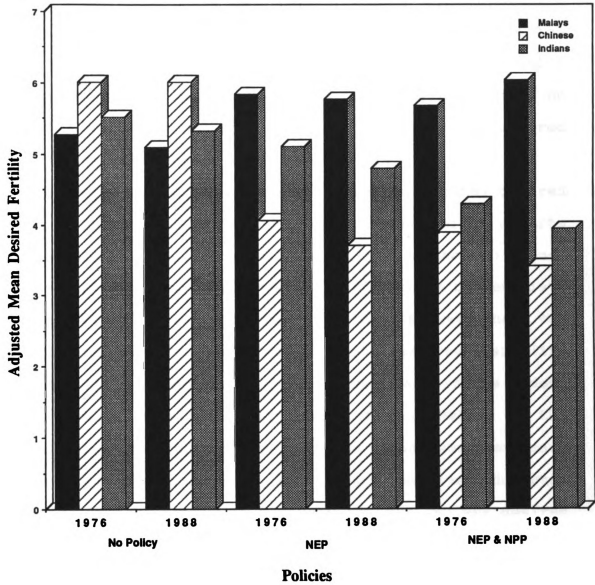
Chinese difference is 0.7 children per woman, the Malay-Indian difference is only 0.2 children per woman. The adjusted mean desired fertility for Malays exposed to policies however, was consistently higher than that for nonMalays. In 1976, Malay mean desired fertility for the second cohort of women, exposed to the NEP alone was 5.84 as compared to Chinese and Indian mean desired fertility of 4.06 and 5.11 children per woman, respectively), which was 1.8 and 0.7 children more per woman than for Chinese and Indians. While this difference did not change between Malays and Chinese in the youngest cohort, the difference between Malays and Indians increased by twofold. Malays in this cohort had a mean desired fertility of 5.67 children per woman, which was 1.8 children more than for

Chinese (3.89) and 1.4 children more than for Indians (4.29) respectively.

In 1988 the pattern remained the same in terms of exposure to policies. There was a very slight fall in the adjusted mean desired fertility for the oldest cohort of women. While the mean desired fertility was lower for Malays (5.09) and Indians (5.32) it remained unchanged for Chinese. Since most of these women had completed their fertility before either policy was introduced, this decline could possibly be explained by child mortality, since these women are 12 years older now and their children would presumably be much older and their period of exposure much longer. These results are also consistent with the bivariate analysis in which infant/child mortality for Chinese was much lower than for Malays and Indians.

The mean desired fertility fell for all three ethnic groups for the cohort exposed to the NEP alone. However while this decline was only one percent for Malays, it was 9 percent for Chinese and 6 percent for Indians. The mean desired fertility for Malays in this cohort was 5.77 children per woman in 1988 as compared with 3.71 children per woman for Chinese and 4.79 children per woman for Indians. However, this pattern changes for Malay women in the birth cohort that by 1988 was exposed to both policies. Between 1976 and 1988, Malay women had revised their expected family size upwards to 6.04 children per woman, an increase of 6 percent, while

Figure 7
Adjusted Mean Desired Fertility
Panel Sample



Chinese and Indian women had revised their expected family size downwards to 3.41 and 3.93 children per woman, a decline of 12 percent and 8 percent for Chinese and Indians, respectively. The NEP had a negative impact on desired fertility for both Malays and nonMalays. However this negative impact is much stronger for nonMalays than Malays. On the other hand, the combined effect of the NEP and NPP had a pronatalist impact on Malays and an antinatalist impact on nonMalays. Consequently the gap in Malay-nonMalay desired fertility has widened (refer to Figure 7).

Table 23 shows the difference in adjusted total desired fertility between 1976 and 1988 for the three birth cohorts differentially exposed to policies. Malays in the two oldest birth cohorts desired an additional 0.16 children between 1976 and 1988. There was a significant difference between these two cohorts and the youngest cohort whose desired fertility increased to 0.40. Conversely, while nonMalays in the oldest cohort desired more additional children than Malays in the same cohort, the situation reversed when comparisons were made between the ethnic groups in the two youngest cohorts. Nonmalays exposed to the NEP or both the NEP and NPP desired significantly less number of additional children than their Malay counterparts. The Malay-nonMalay gap in additional children desired between 1976 and 1988 was widest among the youngest cohort of women (refer to Figure 8).

Table 23
Adjusted Number Of Additional Children Desired
Panel Sample Between 1976 And 1988

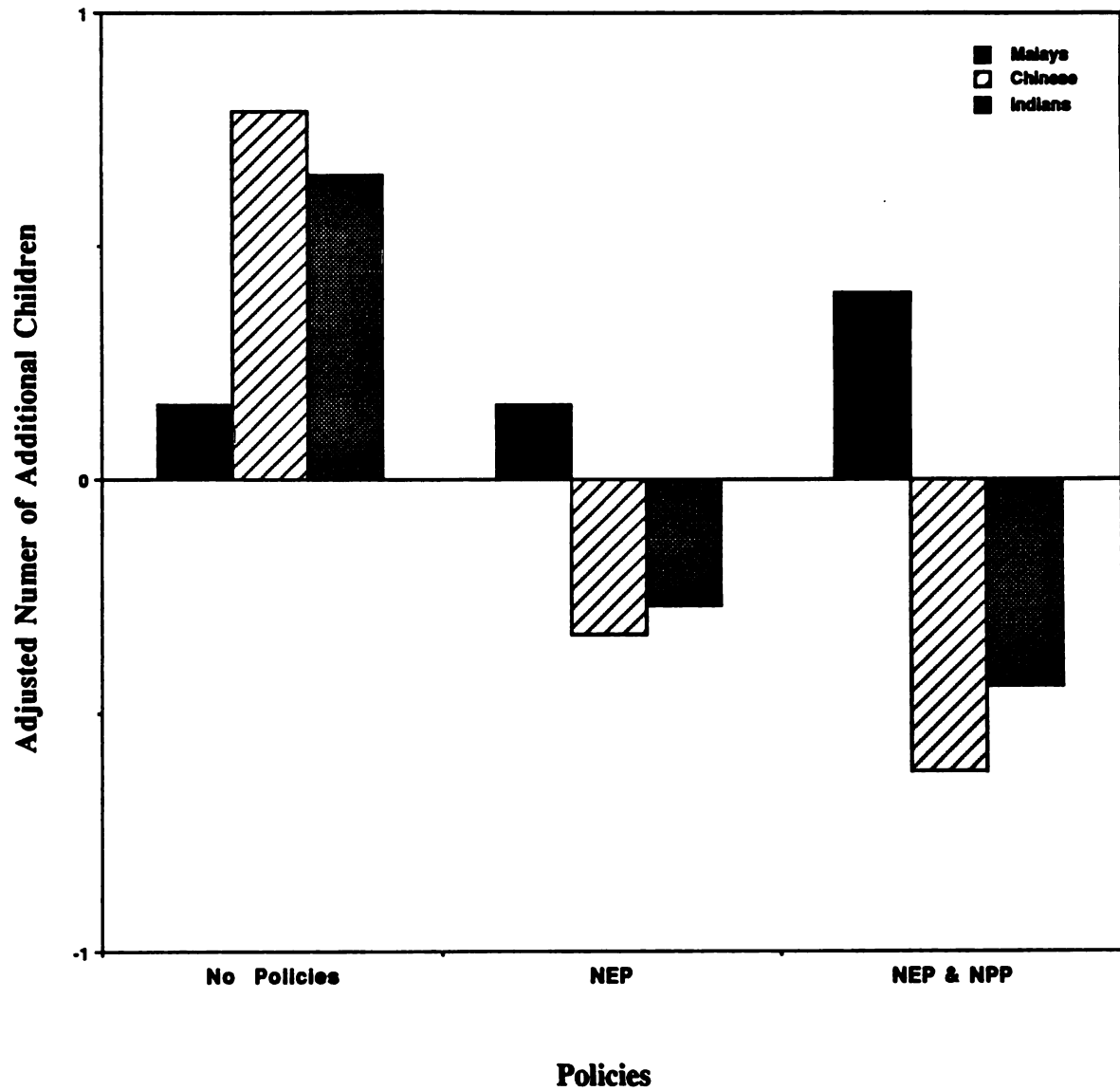
	No Policies	NEP	NEP and NPP
Malays	0.16	0.16	0.40
Chinese	0.79	-0.33	-0.62
Indians	0.65	-0.27	-0.44
Malay-Chinese Gap	+0.63	-0.49	-1.02
Malay-Indian Gap	+0.49	-0.43	-0.84

The above analysis supports the minority group status hypothesis - that when differences in socioeconomic and demographic variables are controlled, there still remain strong ethnic differences in fertility, with ethnic minorities exhibiting a tendency for reduced fertility desires. The evidence supports the conclusion that in recent years in Peninsular Malaysia, Chinese and Indians preferred less children than Malays, because of insecurities associated with being a member of a minority group. These insecurities have become exacerbated in the presence of ethnic-specific government policies - the NEP - leaving them little incentives to take advantage of the pronatalist NPP.

The analysis is consistent with the conclusion that government policies have had an important impact on fertility desires among the three ethnic groups in Peninsular Malaysia. The incentives offered to Malays under the NEP has reduced the costs and increased the benefits of additional children wanted. This in turn has encouraged Malays to take further

Figure 8

**Adjusted Number Of Additional Children Desired
Panel Sample Between 1976 And 1988**



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advantage of the incentives offered under the NPP. The net effect of these two policies has retarded fertility decline accompanying socioeconomic development for Malays. Conversely, the disincentives faced by Chinese and Indians under the NEP discouraged them from utilizing the benefits offered under the NPP. Consequently, there has been a divergence in the Malay-nonMalay gap in desired fertility, that could explain a divergence in their total fertility rates.

CHAPTER VII

CONCLUSION AND POLICY IMPLICATIONS

This research set out to investigate the diverging fertility trend between Malays and nonMalays in Peninsular Malaysia. The analysis of ethnic fertility differentials provided evidence supporting the characteristics hypothesis that ethnic differences were a result of socioeconomic and demographic characteristics. However, when socioeconomic and demographic differences were controlled ethnicity was found to be an important explanatory variable which exerted an independent influence on fertility behavior. This result supports the minority group status hypothesis.

In seeking to explain ethnic fertility differences, this research went beyond the simple explanations of characteristics versus the minority group status hypothesis. It extended the conceptual framework of the minority group status hypothesis to incorporate the role of the state in exacerbating minority insecurities via the most influential government policy since the post-Independence era, the New Economic Policy. Logistic and multivariate analyses showed that the ethnic specific NEP, which singled out Malays for favored treatment, could have had an antinatalistic impact on

Chinese and Indian desired fertility, by creating uncertainties in the minds of nonMalays for the future of their children, by raising the cost of educating their children, and increasing the barriers to their employment. In doing so, it left nonMalays with little incentive to take up the call of the Government to have more children in line with the New Population Policy. Alternatively, the benefits accruing to Malays from the NEP better equipped them to avail of the pronatalistic incentives of the NPP. The combined effect of these two policies could have resulted in desired fertility for Malays being much higher than for Chinese and Indians, which could explain the diverging Malay-nonMalay fertility trend.

Weaknesses And Drawbacks Of The Study

The minority group status hypothesis assumes that members of ethnic groups with a low minority status suffer from feelings of insecurities, which in turn affects their fertility behavior. This theoretical framework was originally formulated to explain ethnic fertility differences in the West - mainly in the United States. Research in this area of enquiry has not come up with a consistent explanation of the pattern of minority group fertility. Part of this is the lack of a conceptual clarification and a failure to measure the key theoretical variables. The problem arises when one moves from the aggregate categorization of minority group status to the

individual or family unit level. Minority group status to a large extent depends on ethnic identity, and ethnic identity entails more than just membership in an ethnic group.

The fundamental weakness of Goldscheider and Uhlenberg's theory is their failure to distinguish between what are really two conflicting theories: one explaining reduced minority fertility as a reaction to external structural pressures and another explaining high or low fertility in terms of cultural norms and ideals. One cannot say that minority group status will always reduce fertility. Intergroup differences in values and behavior persist even when minorities and majorities achieve the same socioeconomic status. Thus fertility differentials should be considered as resulting from the interaction between structural and cultural assimilation as well as the history and traditions of particular groups. These two effects, unless measured directly, may be confounded in any empirically observed total effects of minority group status on fertility. Moreover structural factors and cultural norms may not in many cases be exclusive of each other. Cultural norms alone, or in conjunction with insecurities, may account for an ethnic difference in family size. Goldscheider and Uhlenberg do not take into account the confounding effects of these two directional forces and assume that the absence of a normative system discouraging the use of contraceptives is enough to offset the cultural norms guiding fertility

behavior. Cultural nuances cannot be ignored in seeking to explain fertility differences.

This study, like most other studies on the minority group status effect, is based on data from a survey not specifically conducted for the purpose of this research. The problem with using such a dataset is that often it does not contain information on some key theoretical variables relevant to this type of study, for example information on group norms and values, as well as individual decision making regarding family size and fertility based on economic, biological and cultural factors. This research therefore suffers from a fundamental weakness - the failure to incorporate cultural factors as explanatory variables of differential fertility. If it were possible to redo this survey for the purpose of my research, I would incorporate questions on: an individual's ethnic group perception - whether a minority group is conscious of its minority status; the type and strength of intragroup interaction, group solidarity, and kinship ties; the faith, common beliefs, rituals, and norms about family size; and pattern of living and distributional differences.

Another strategy that might strengthen the validity of the arguments forwarded in this research, is to do a follow-up study of the same ethnic groups exposed to different circumstances in a different national or regional setting and to identify aspects of these settings that might account for observed differences in fertility trends. One possibility is

to compare Chinese, Malay, and Indian fertility behavior between Singapore (in which the Chinese are the dominant group, and the latter two ethnic groups are minorities), and Peninsular Malaysia.

Another fundamental weakness of this study, as with any study that relies on statistical control and explanation, is the failure to take into account the multidimensional nature of some key variables, like education, income and employment. For example, education varies not only in terms of the number of years of schooling, but also according to the institutions offering them. Researchers often argue that when comparisons of thousands or even hundreds of people are made, these differences cancel each other out. However, the problem with this approach is the failure to recognize that individuals from different racial or ethnic groups differ not only randomly, but also systematically. As such the same data can produce varied results depending on how much they are disaggregated or how many variables are held constant.

Another problem confronting statistical analysis is the non-quantifiable nature of some differences. The failure to incorporate non-quantifiable differences, essentially means that one assumes that these differences are negligible in their effect on outcomes. To control for only some of the variables and assuming that the remaining disparities represent discrimination is implicitly an assumption that groups are distributed similarly along the unexamined

dimensions. Ultimately this research is limited by the available data and the dimension it covers.

While this research started from the premise of actual fertility trends, the Total Fertility Rate, it was limited to the study of total desired fertility. Conclusions of the potential impact on actual fertility behavior were drawn from the effects of ethnicity and government policies on total desired fertility. Nevertheless the Panel Sample included all women regardless of their fecundity, and as such did incorporate women who had mostly completed their fertility at the time of the second interview in 1988. These trends in total desired fertility should therefore more closely resemble realized fertility patterns. Since the conclusions derived from the Panel Sample reaffirmed the findings of the MFLS-1 and MFLS-2 New Samples, the findings of this research do provide evidence into the causes of ethnic fertility differentials in Peninsular Malaysia. However, as noted in the text, desired fertility is one of the two - the other being the control over one's fertility - most important factors influencing the fertility of ever-married women. As such the study of total desired fertility forms an important precursor to the study of actual fertility behavior.

A major difficulty encountered in carrying out this research centered on the issue of measuring policy effect. As observed earlier, this research relied on data gathered for purposes not specific to the aim of the study, a problem

commonly encountered by most researchers. As such it did not contain attitudinal responses of the public to the NEP or the NPP. Moreover, due to the sensitivity associated with the NEP, surveys in the past have carefully avoided any direct questions dealing with the public's response to this policy. Previous studies had not attempted to measure insecurities associated with government policies and its potential impact on fertility behavior directly, but have drawn conclusions on the impact of policies based on changes over time and its correspondence to the time policies were introduced. Hence there was no precedence to follow. In this research birth cohort was used as a criteria for measuring the policy effect by examining how women differentially exposed to the NEP and NPP differed in their fertility behavior in comparison to women not exposed to either policy. This research attempted to overcome the perennial problem associated with trying to untangle age, period and cohort effects. Given that there was reasonable confidence to warrant the importance of policies, whose effects are time dependent, this seemed the most reasonable and straightforward way of handling the problem. Future studies would benefit much from more indepth interview surveys that incorporate attitudinal questions relating to the role of the state.

Scope For Future Studies

It is hoped that this research would benefit future studies in a number of ways. By emphasizing the historical evolution of ethnic relations in Peninsular Malaysia, it provides a political and institutional framework for the study of ethnic fertility differences, beyond the framework sketched out by the characteristics and minority group status hypotheses. In attempting to measure policy effects, it sets a precedence for future studies. This research has also laid the foundation for future studies using the two Malaysian Family Life Surveys to assess the impact of social, demographic, economic, and institutional factors on actual fertility behavior, and to gauge how well the different ethnic groups are able to translate their desired fertility into actual childbearing performances. Most importantly, this research provides the scope to explore how well desired fertility is a predictor of actual fertility behavior in Peninsular Malaysia.

Policy Implications

The factors influencing fertility in any society are complex, and most theories purporting to explain fertility behavior do not look broadly at the context of fertility change. While it may be individual women who bear the babies, their decision to do so, or not, may ultimately depend on society. As Jones (1990) pointed out, an individual's

childbearing decisions may be influenced by three sets of forces: the social, economic and political milieu in which they are placed; specific exhortations or pressures by governments or communities (these two forces together comprise the institutional context within which fertility decisions are made); and finally, factors within the personal and family environment. It is the former two forces that must be reckoned with in attempting to explain wide differences within societies, as has been seen in the case of Peninsular Malaysia.

In conclusion I raise two important issues. Firstly, the NEP was formulated to improve the socioeconomic status of Malays vis-a-vis nonMalays. Although it was not a population policy per se, it nonetheless appears to have had important effects on ethnic fertility behavior. The improvement in the quality of life accompanying the implementation of the NEP (together with socioeconomic changes occurring during the same period), has had fertility inhibiting effects on all three ethnic groups in the short run, and on nonMalays in the long run. The NPP on the other hand is a population-specific policy aimed at increasing the size of the overall population. However in the presence of the NEP, the success of the NPP, if it is indeed aimed at increasing the size of the overall population irrespective of ethnicity, is questionable. It is therefore important for policy makers to view population responsive policies as a subsystem of broader government

policies, their success dependent upon the influence of these other policies.

Secondly, in an environment where ethnicity exerts a strong independent influence on fertility behavior, population policies may need to be ethnic specific. The failure to recognize the importance of differential ethnic response could result in a changing ethnic composition, which could have serious social and political repercussions for minority groups. The likelihood of renewed fertility decline for Malays has been a matter of some controversy. While Leete (1989) argued that Malay fertility is not likely to decline substantially in the coming decade, Hirschman (1986), Lim et al (1987), and Jones (1990) think otherwise. Nevertheless the continued presence of the NEP (which was originally slated to end in 1990), coupled with the government's low-key approach to family planning, and renewed emphasis on family development, may mean converging ethnic fertility patterns may not be in the horizon in the near future. Given the fact that Malays are already numerically in the majority, if desired fertility is translated into actual childbearing patterns, it could mean an increasing Malay population in the face of a dwindling minority population.

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