

PATTERNS OF MORTALITY DIFFERENTIALS BY MARITAL STATUS IN LOW MORTALITY COUNTRIES

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Social stress has been considered an important etiological factor in determining health risks. The debilitating effects of social stress on health, and especially on degenerative and/or man-made illnesses are well documented.⁽¹⁾ The link between stress and illness has also led to a new approach to the study of mortality risks in populations whose major causes of death have already shifted from infectious illnesses to degenerative and man-made illnesses (Kitagawa and Hauser, 1973; Dodge and Martin, 1970).

Marital status, as one major socio-demographic variable which indicates different degrees of social integration and social stress, has become one major area for the investigation of social origins of differential mortality risks in the United States (Gove, 1973; Helsing et al, 1981). It is found that, in Western countries, the supportive nature of marital and familial roles has significant impact on protecting individuals against death (Gove, 1973; Young, 1963). It is also postulated that mortality differentials by marital status account, in part, for the sex differentials of death rates (Retherford, 1975).

Investigation of the relationship between marital status and mortality risks is still confined to Western nations. The impact of marital status on mortality risks in

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(1) Levine and Scotch (1970) summarize the relationship between stress and illness from various sources of evidence such as clinical impressions, laboratory studies and a number of epidemiological studies. Research findings on relationships between stress and cause-specific illness (such as cancer), however, are less clear (e.g. Reed et al, 1984).

different cultural regions has not been systematically investigated.⁽²⁾ Do marriage and the family exert the same health-protecting function on people in non-Western countries as in Western countries? If differences exist, what are these differences and what cultural factors cause such differences? Do these cultural differences persist or diminish over time? These are important sociological questions in dealing with cultural and social change. As a preliminary attempt to address these questions, the present study will investigate common and regional-specific patterns and trends of mortality differentials by marital status in low mortality countries in the East and West cultural regions.

CROSS-NATIONAL PATTERNS OF MORTALITY DIFFERENTIALS

Cross-national studies of mortality patterns have focused on mortality levels, causes of death, and age- and sex- mortality patterns. Although each country has its own distinct mortality history, researchers have developed methods to identify general mortality trends and patterns. Based on these findings, some researchers went one step further to examine patterns of mortality variations and look for socio-cultural explanations for such variations (Lopez and Ruzicka, 1983; Preston, 1976; Nathanson, 1984).

One of the most pronounced international mortality features associated with global mortality decline is the widening of sex mortality differentials. This phenomenon is consistently reported in mortality studies from both developed and developing countries (Lopez and Ruzicka, 1983; Enterline, 1961; Retherford, 1975). The changing features of sex mortality differentials in developed countries have already given rise to sociological awareness of the effect of gender roles. It is suggested that differential exposure to stress and other health risks is associated with such sex mortality differentials. Studies of cardio-vascular diseases support the differential stress and risk thesis (Lopez, 1983: 116). Enterline (1961: 323-324) also suggested that the increasing sex mortality differential is an indication of the

(2) There are a number of studies dealing with international marital mortality differentials for specific cause of death such as suicide (e.g. Danigelis and Pope, 1979). Studies on mortality of all causes in non-Western cultures still focused on individual nations. For example, Lin's (1974) study of marital differentials in Taiwan found different patterns. However, the problem of reliability of the data limits its implication.

maladaptation of men in modern-industrial societies in terms of coping and life styles.⁽³⁾ Gove (1973) and Retherford (1975) further decomposed mortality rates of males and females by marital status in the United States. They found that although women were the advantaged sex in terms of survival, marriage provided more protection against death for men than for women.

* Mortality studies based on aggregated mortality data require special caution with regard to a number of potential biases in death reporting and population monitoring systems. In studying international mortality patterns, especially causes of death, additional biases peculiar to different nations must also be noted.⁽⁴⁾

Although there are many artifactual problems in international mortality data, these problems are less serious in low-mortality countries where life expectancies at birth (e_0) are above seventy, because most low-mortality countries have relatively good diagnostic and reporting systems. Thus, cross-national studies on low-mortality countries can provide relatively accurate estimates of changes and variations in mortality rates.

Recently, a number of developing countries in non-Western cultural regions such as East Asia and Latin America (see Table 1) have been undergoing the same mortality transition. The increasing number of low-mortality countries in non-Western regions provides a good opportunity for the investigation of patterns of mortality associated with demographic and sociocultural factors in determining the relative advantages (or disadvantages) of survival in different countries.

In an investigation of mortality patterns in 49 low-mortality countries, Brouard and Lopez (1985) identified four clusters of age-mortality patterns which roughly correspond to the four regional patterns specified by Coale and Demeny (1966).⁽³⁾

(3) The trend for the sex differential of death due to lung cancer (one major factor in causing sex mortality differential) has been changed recently so that women's advantage from lung cancer has decreased and a new convergence trend of the sexes has started in the U.S. and in northern European countries (Lopez, 1983).

(4) The Coale and Demeny life tables were derived from a set of 192 life tables by sex recorded from actual population from several time periods. Most of these tables were from Western countries (179 out of 192) and four age-patterns were identified. Those patterns were labeled "North", "South", "East" and "West".

Table 1. Life Expectancies at Birth in Non-Western Regions (1980s)

Region & Country	e_0	Region & Country	e_0
Asia		Latin America	
(Southwest Asia)		(Middle America)	
Cyprus	74	Belize	70
Israel	74	Costa Rica	73
Kuwait	71	Panama	71
Qatar	71		
United Arab Emirates	70	(Caribbean)	
		Barbados	71
(Southeast Asia)		Cuba	73
Brunei	71	Grenada	70
Singapore	71	Guadeloupe	70
		Jamaica	70
(East Asia)		Martinique	71
Hong Kong	72	Netherlands	
Japan	77	Antilles	71
Taiwan	73	Puerto Rico	73
		Trinidad and Tobago	70
Africa		(Temperate South America)	
(East Africa)		Argentina	70
Seychelles	70	Chile	70

Source: "1985 World Population Data Sheet", Population Reference Bureau, Inc. Washington, D.C.

For example, the Mediterranean and Latin American countries such as Cuba, Panama, Portugal, Italy, and Spain have a relatively high infant mortality rate which correspond to the updated "South" model. The Northern European countries such as England, Ireland, Norway and Denmark are characterized by a relatively high mortality in the geriatric cohort and correspond to the "North" model. Countries such as Japan and Hong Kong also display a similar "North" pattern.

With regard to the groupings identified here, the consistency of clusters across male and female mortality patterns suggests that there may well be pervasive national

circumstances which determine a particular mortality pattern and its group membership. Brouard and Lopez suggested that socio-geographical clusters which group together the Southern European countries on the one hand, and the Anglo-Saxon, Latin American, or Asian countries on the other are from a common cultural influence on national traits across nations. On closer examination of these cultural traits and associated risk factors will by themselves provide further explanations for the relationships.

In another study on mortality trends in eight low-mortality countries, Mesle (1985) examined cause-specific mortality trends and their underlying factors in these countries between 1950 and 1980. He discovered that, for infectious and cerebrovascular diseases, a downward trend is the general rule. The trends observed for cardiovascular diseases, accidents and suicides, on the other hand, vary enormously from one country to another. The variations are also wide between the sexes.

According to Mesle (1985), these highly differentiated mortality levels and trends are caused by a number of socio-cultural factors. For example, in Japan, the sharp decrease in cerebrovascular mortality is partly the result of a healthier diet connected with a national policy of active prevention. The particularly large differences observed between male and female mortality in France are related to the difference in the consumption of alcohol.

Studies which focus on specific cultural factors in determining mortality patterns across nations are very rare, but these studies have received great attention in terms of theoretical and methodological significance. For example, a number of studies on different rates of mortality due to coronary heart disease in Japan and in the United States suggested that culturally fostered strong social ties in Japan might be the major reason behind its low mortality rate from heart disease (Matsumoto, 1970; Marmot, et al., 1975; Yano, et al., 1979).

In general, with restricted and limited information on national mortality data, most cross-cultural or cross-national studies on mortality differentials still focus on only age, sex patterns and patterns of cause structures. In most countries, mortality risks associated with differential involvement in various social organizations have not been thoroughly investigated and/or interpreted through direct examination.

In the following section, mortality by marital status on low-mortality countries is examined. This preliminary examination is to identify the common and cultural-regional patterns of mortality associated with the family protective theme.

MORTALITY DIFFERENTIALS BY MARITAL STATUS ACROSS NATIONS

Since international mortality statistics by marital status are available in recent United Nations' publications, it is possible to examine common patterns of marital mortality differentials cross-nationally and to ascertain variations in mortality patterns among different cultures. Particular attention will be given to economic developmental factors which might also play a role in affecting the patterns of mortality differentials among different cultures.

I. The Data

International information on mortality rates by marital status, age and sex (MASDRs)⁽⁵⁾ has been published in the United Nations' Demographic Yearbook periodically since 1968. In the most recent volume (1985), Marital-Age-Sex-Specific Death Rates (MASDR) of four Asian and eighteen Western (European and North American) low-mortality non-communist countries are published. Among these countries, those with uninterpretable⁽⁶⁾ mortality rates or with rates derived from small numbers of deaths were eliminated from our analysis. Of those remaining, only two countries in Far East cultural regions – Hong Kong and Japan – which maintain relatively reliable MASDRs. Among European and North American countries, seven were randomly selected. In addition to the U.N. list, mortality information on Taiwan and the United States which is available from national registration and census reports is also included in the international mortality profile.

Among these countries (see Table 2), Japan is the only industrialized Asian nation with a high per capita income; Hong Kong and Taiwan are middle income countries. In the Western cultural region, Canada, the United States, France and the

(5) MASDR = number of deaths by marital status, age and sex/population by marital status, age and sex *100,000.

(6) Due to confounding factors (such as underreporting or misreporting) in death reporting and census (or household registration).

United Kingdom are high-income countries; Greece, Italy and Portugal are middle-income countries.

Table 2. Life Expectancy and Income Level of Selected Countries

Country	Life Expectancy		Income Level	GNP Per Capita Dollars (1978)
	1960	1978		
Asian Cultural Region				
Hong Kong	65	72	Middle	3040
Japan	68	76	Industrialized	7280
Taiwan	64	72	Middle	1400
Western Cultural Region				
Canada	71	74	Industrialized	9180
U.S.	70	73	Industrialized	9590
France	70	73	Industrialized	8260
U.K.	70	73	Industrialized	5030
Denmark	72	74	Industrialized	9920
Greece	68	73	Middle	3250
Italy	69	73	Middle	3850
Portugal	63	69	Middle	1990

Source: The World Bank. 1980. "World Development Report, 1980." Table 1. (pp. 110-111) and Table 2. (pp. 150-151)

Because mortality rates for the divorced and the young widowed populations (especially younger than 35 Years) suffer more from small numbers and reporting errors, this analysis is thus confined to the married, single and widowed populations between the ages of 35 and 74.

II. The Common Pattern of Mortality Differentials by Marital Status

An examination of the Age-Sex-Specific Death Rates (ASDR) of the eleven countries indicates that ASDRs increase with age. For all age groups, men have higher mortality rates than women. The average ASDR of men is 4.2 (per 1,000) for ages 35-44, and 42.95 for ages 65-74. For women, the average ASDR is 2.25 for ages 35-44, and 23.18 for ages 65-74 (see Table 3) while the average sex mortality ratio is about 2 (ranging from 1.78 to 1.97 at different ages).

Table 3. Average ASDRS by Marital Status and Sex of Eleven Countries

	All	Married	Single	Widowed
Men				
35-44	2.75 (.63)*	2.21 (.52)	6.56 (3.36)	8.52 (3.06)
45-54	6.76 (1.05)	5.92 (.76)	13.50 (4.32)	15.21 (3.04)
55-64	17.00 (1.94)	15.50 (1.63)	28.76 (9.27)	29.02 (6.77)
65-74	42.95 (4.00)	39.91 (4.60)	66.72 (30.3)	57.94 (6.22)
Women				
35-44	2.25 (.21)	1.34 (.24)	3.76 (2.86)	2.84 (.92)
45-54	3.74 (.48)	3.37 (.49)	7.80 (6.35)	5.41 (1.14)
55-64	8.87 (1.23)	7.85 (1.19)	16.92 (15.88)	11.16 (2.38)
65-74	23.18 (4.01)	20.98 (4.81)	43.21 (46.01)	25.98 (4.10)

* numbers in parenthesis are standard deviations.

Source: data used for calculating rates are from:

- (1) 1985 U.N. Demographic Yearbook,
- (2) 1980 Demographic Fact Book of Republic of China, and
- (3) 1980 U.S. Census Report and Vital Statistics.

Table 4. Average Sex Mortality Differentials by Marital Status of the Eleven Countries

	All		Married		Single		Widowed	
	Ratio	(d)*	Ratio	(d)	Ratio	(d)	Ratio	(d)
Age								
35-44	1.78	(1.95)	1.67	(1.56)	1.67	(3.25)	3.03	(6.75)
45-54	1.85	(3.11)	1.77	(2.54)	2.10	(5.70)	2.86	(9.80)
55-64	1.97	(8.32)	1.98	(7.38)	2.19	(12.20)	2.60	(17.77)
65-74	1.87	(19.77)	1.94	(18.93)	1.97	(23.51)	2.25	(31.96)

* d = male mortality rate - female mortality rate

Source: data used for calculating rates are from:

- (1) 1985 U.N. Demographic Yearbook,
- (2) 1980 Demographic Fact Book of Republic of China, and
- (3) 1980 U.S. Census Report and Vital Statistics.

When mortality rates of different marital groups (MASDRs) are examined separately, the average sex mortality ratios for the married and single groups are about the same with only a slight increase in middle-aged groups (2.10 for ages 45-54 and 2.19 for ages 55-64). For widowed groups, the sex mortality ratios are markedly higher (compared with other marital categories). Their sex ratios reach 3.03 for ages 35-44 and maintain at least 2.25 for other age groups (see Table 4).

Mortality ratios can mask the differences between groups when denominators are quite different, because the measure does not indicate the direction of the course of mortality. For example, a higher sex mortality ratio in a population can result from any of the following situations: (1) both male and female mortality rates in this population are higher than other populations, but the excess male deaths are greater; (2) male mortality of this population is higher, but there is no difference between females; (3) male mortality of this population is higher than other groups, but the female mortality rate is lower; (4) mortality rates for both sexes are lower in this population than other groups, but the rate for females is relatively much lower; and (5) the male mortality rate is the same but female mortality rate is much lower. In other words, the difference in sex ratios can result from many different mortality conditions. Thus, more detailed examinations on sex mortality ratios are required.

In order to identify features which constitute the similarity as well as the difference in sex mortality differentials among different marital groups, mortality rates of different marital groups for the two sexes are examined. As Table 3 shows, married people have the lowest average mortality rates for both sexes and for all age groups. Among unmarried people, the relationship is not clear. For men, the average mortality rates of younger widowed groups are higher than those of never-married (8.52 vs. 6.56 for ages 35-44), while the relationship is reversed for older groups (higher than widowed groups at all ages), and the average mortality ratios (single versus widowed) increase slightly with age (1.26 for ages 35-44 and 1.57 for ages 65-74).

From the above figures, it appears that the high sex mortality ratios in widowed populations are due both to relatively low female ASDR and the relatively high male death rate of the same marital category. The reasons for such differences in age-sex mortality patterns in unmarried populations are unknown and need further studies.

Mortality differentials vary among these eleven countries. For example, sex mortality ratios in France are markedly higher (from 2.14 to 2.53) than those in other countries. Sex mortality differentials of Canada and Portugal are also higher than the average figures. The high sex mortality ratio in France has received attention from other cross-national mortality studies (e.g., Mesle, 1985) and was attributed to their high male alcohol consumption. However, given the sex mortality ratios for each marital group, the excessively high sex ratios do not appear in the married group; even so, the ratio is greater in unmarried groups (8 out of 12 unmarried groups have ratios above 3.00). In other words, the high sex mortality ratios in France are due to the excessively high sex mortality ratios among unmarried groups.

The other marked difference in sex mortality ratios among these countries is the mortality ratios of single groups in Taiwan. In Taiwan, sex mortality ratios of single groups are lower than the averages (0.54-1.09 in Taiwan and 1.67-2.19 on average). This low sex mortality ratio is due to the high mortality rate of single females, a discovery which also requires further explanation.

When the mortality differentials of the two sexes among these countries are examined separately, the patterns are clear among the high-income Western countries (U.S., Canada, France, England and Denmark). Single/Married mortality ratios are relatively higher in the younger group (around 2.00 for females and 3.00-4.00 for males) and gradually decrease as age increases. The patterns in non-Western countries and middle-income countries are not as clear. In Japan and Taiwan, the mortality ratios of single groups divided by married groups are much higher than those averages. Mortality ratios of widowed females divided by married females in Greece, Italy and Portugal, on the other hand, are lower than the averages.

In summary, average features of mortality differentials among the 11 low-mortality countries indicate that married people have lower mortality rates than those of any other marital categories. The unmarried/married mortality differentials are greater for men than for women, and the sex mortality differentials are greater in widowed groups. There are also variations across countries. Some of the variations seem to be related to the nation's income level; others cluster within macro-cultural regions. In order to understand the magnitude of the cultural and developmental impact on mortality differentials of these eleven countries, a further investigation of the relationships among these socio-cultural factors and marital-age-sex-specific

Table 5. Average Ratios of Indicated Marital Groups of the Eleven Countries

	Single vs. Married	Widowed vs. Married	Single vs. Widowed
Men			
35-44	2.89 (.96)	3.81 (.71)	0.76 (.23)
45-54	2.30 (.73)	2.56 (.32)	0.90 (.28)
55-64	1.88 (.64)	1.87 (.38)	1.04 (.38)
65-74	1.66 (.66)	1.46 (.16)	1.15 (.49)
Women			
35-44	2.67 (1.43)	2.11 (.51)	1.30 (.57)
45-54	2.24 (1.39)	1.60 (.19)	1.40 (.80)
55-64	2.05 (1.48)	1.43 (.27)	1.53 (1.28)
65-74	1.85 (1.31)	1.26 (.31)	1.58 (1.45)

* numbers in parenthesis are standard deviations (SD).

Source: data used for calculating rates are from:

- (1) 1985 U.N. Demographic Yearbook
- (2) 1980 Demographic Fact Book of Republic of China, and
- (3) 1980 U.S. Census Report and Vital Statistics.

mortality rates is presented in the following section.

III. Developmental Effects

Economic modernization has a significant impact on the level of mortality and the disparity of sex mortality differentials. In an analysis of income growth and mortality levels of 30 countries, Preston (1976: 65-83) discovered that national income alone accounted for about 20 percent of variation in changes of life expectancy; the relationship is stronger among low-income nations.

Economic modernization may affect certain environmental factors such as health services and nutrition, which, in turn, affect the individual's survivorship. However, about 80 percent of the variations in mortality are still unidentified. It is also unclear how and to what extent economic modernization alters the structure of survivorship among populations whose social involvements (e.g. family involvement)

differ.

Theories of family and social change, on the other hand, postulate a different trend of family support and provide different implicit predictions for stress-differentials among different marital groups. In *Suicide* (1951), Durkheim predicted that rapid economic growth reduced the family's integrational and regulatory nature and, thus, reduced its protective function. However, according to Parsons (1954) and Shorter (1975), industrialization and modernization simply changed the function of the family from a more diffused nature to a more specific nature without reducing its importance.⁽⁷⁾

Although the above theories uphold different predictions and arguments concerning changes in the family, the impact of economic growth on the familial protection is still unknown. Thus, when cultural interpretations are made to explain variations of international mortality patterns which include countries at different stages of economic development, caution is advised. In order to disentangle cultural effects from other developmental effects, a statistical procedure is needed which assesses the direction and the degree of such influence before carrying out a cultural analysis.

Since the general health condition and the economic situation of a country may well affect mortality conditions of different marital populations, a multiple regression analysis is performed to determine the effects of these two important development factors. In this analysis, the life expectancy of a country is used to indicate the country's general health conditions and per capita income is used to determine its economic condition. The multiple regression equation is

$$\text{MASDR} = a + b_1 X_1 + b_2 X_2 + e$$

where X_1 is the life expectancy of the nation in 1978 and X_2 the level of per capita income of the nation in the same year. The regression result is in the following equation:

(7) Parsons (1954) claimed that the family's function had shifted from multi-functions to only expressive and socialization functions. Shorter (1975), on the other hand, maintained that "the surge of sentiment" is the most distinctive feature in family relations.

$$\text{MASDR} = 76.48 - .7837X_1 - .00035X_2 + e$$

$$R^2 = 0.0118$$

The regression coefficients in the equation indicate that life expectancy and GNP per capita of a country are negatively related to MASDRs. However, the relationships are not significant at the 0.1 level, and these two factors together only account for 1.18 percent of the variation in MASDRs. In other words, the improvement of mortality levels and economic growth do not exert significant impact on mortality differentials among different marital groups. This discovery does not provide sufficient information on the protective nature of the family in countries with differing levels of economic development. However, it is apparent that Durkheim's prediction of diminishing family protection during economic development is not supported from the mortality data of these eleven low-mortality countries.

In summary, a nation's economic performance and public health conditions may affect the survivorship of the population as a whole; however, when a nation's mortality is reduced to a level which eliminates most deaths caused by poor nutrition or infection, developmental factors become negligible in explaining the survivor structure among populations whose familial involvements are different. The result encourages the exploration of cultural factors as alternative social forces in explaining the difference in mortality patterns among countries.

IV. Effects of Marital Status, Sex, and Cultural Region

Mortality patterns differ by sex and by marital status. In this section, the effects of marital status, sex, and cultural region on MASDRs of the eleven countries are examined. A 3-way analysis of variance is performed to assess the relative importance of each factor in explaining the variations of MASDR.

Partitioning the variations in rates reveals the relative importance of the main effects and interaction effects of marital status, sex and culture. For the single-married comparison, marital status is the most important factor in explaining mortality variation. The relationship is stronger for the younger group (age 35-44) ($R^2 = 36.21$) than for the older one (age 55-64) ($R^2 = 23.27$). Although sex and culture

Table 6: 3-way Analysis of Variance of ASDRs of the Eleven Countries

	Percentage Variation in ASDRs Explained by Each Effect		
	Single vs. Married	Widowed vs. Married	Single vs. Widowed
Part A: Not controlling for development factor			
*Main Effects (age 35-44)			
Marital status	33.95**	36.90**	0.56
Sex	9.93**	25.85**	37.90**
Culture region	6.53	0.33	5.30*
Interaction effects			
Marital*Sex	2.77	13.99**	4.36
Culture*Marital	4.35	0.02	2.61
Main Effects (age 55-64)			
Marital status	23.27**	22.84**	1.27
Sex	17.75**	52.44**	37.29**
Culture region	5.14*	0.43	6.82*
Interaction effects			
Marital*Sex	0.82	8.41**	1.53
Culture*Marital	5.00*	0.39	2.83
Part B: Controlling for development factors			
Main Effects (age 35-44)			
Marital status	36.21**	39.11**	0.63
Sex	10.60**	27.45**	42.22**
Culture region	4.39*	1.56	6.78*
Interaction effects			
Marital*Sex	2.96	14.83**	4.85
Culture*Marital	2.64*	0.02	2.92
Main Effects (age 55 - 64)			
Marital status	24.58**	23.29**	1.36
Sex	18.73*	53.49**	39.68**
Culture region	2.40	0.78	4.47
Interaction effects			
Marital*Sex	0.85	8.57**	1.62
Culture*Marital	5.53*	0.40	3.02

Source: data used for calculating rates are from:

- (1) 1985 U.N. Demographic Yearbook,
- (2) 1980 Demographic Fact Book of Republic of China, and
- (3) 1980 U.S. Census Report and Vital Statistics.

** : significant at the .01 level

* : significant at the .05 level

factors have a significant impact, the relation is not strong. In the younger group, sex and culture together account for only a 16.56% variation. In the older group, it is 22.7%.

For the widowed-married comparison, the explanatory power of marital status is about the same as in the single-married comparison (22-37% variation) but the power of the sex factor increases. In the younger group, the sex factor constitutes a 25.85% variation; in the older group, the importance of sex exceeds the marital status factor and contributes to 52.4 percent of the variation. Sex also works as the most important factor in the single-widowed comparison. However, the effect of marital status in the single-widowed comparison is negligible (.56 percent for the younger group and 1.27 percent for the older group).

Finally, the cultural region effect is weak but statistically significant. Despite the differences within and among each country, the cultural region still has a significant impact on MASDRs. For the single-married and single-widowed comparisons, the cultural-region factor accounts for 5.14 to 6.82 percent of the variation in rates. For the widowed-married comparison, the cultural effect is negligible. In other words, mortality experiences of single and married people differ between Asian and Western regions. Although the cultural-region impact is not strong, the results led to a further inquiry.

In part B (Table 6), the values are derived after the control of developmental factors. Since development factors (life expectancy and income level) have a negligible impact on MASDRs, the result from such a control does not differ from those values without such a control (part A).

In order to compare and contrast mortality patterns in the two cultural regions, average regional MASDRs and MASDR-ratios are examined. Table 7 and Table 8 show regional averages of mortality rates and ratios.

In Table 7, age mortality patterns of married population in Asian and Western regions are similar (also see Figure 1). However, the level of mortality of each marital group differs, the structure of mortality rates among different marital categories also differs between regions. In general, married groups in both cultural regions have lower mortality rates than unmarried groups (Figure 2 and 3). It is also clear that

Table 7. Average MASDRs in Asian and Western Regions

	Single		Married		Widowed	
	Asia	West	Asia	West	Asia	West
Men						
35-44	8.2 (4.9)	5.9 (2.8)	2.8 (0.5)	2.1 (.52)	9.2 (2.1)	8.3 (3.5)
45-54	14.5 (3.4)	13.1 (4.8)	5.8 (1.0)	5.9 (0.7)	13.7 (2.8)	13.8 (3.1)
55-64	32.6 (9.5)	27.3 (9.4)	15.2 (2.2)	15.6 (1.5)	31.4 (13.0)	28.1 (3.7)
65-74	83.0* (23.9)	64.7* (25.6)	35.0 (9.7)	40.5 (3.3)	52.5 (2.7)	58.6 (6.7)
Women						
35-44	6.5** (4.9)	2.7** (0.5)	1.5 (0.3)	1.3 (0.2)	2.9 (1.7)	2.8 (0.7)
45-54	13.1* (11.8)	7.0* (0.9)	3.6 (0.8)	3.6 (0.4)	5.7 (1.8)	5.3 (0.9)
55-64	30.2* (29.6)	11.9* (2.6)	8.2 (1.8)	7.7 (1.0)	12.5 (4.1)	10.7 (1.5)
65-74	42.6** (85.4)	43.3** (8.9)	18.7 (9.1)	21.3 (3.1)	24.5 (4.2)	26.2 (4.3)

numbers in parenthesis are standard deviations (SD).

* the difference between two regions is significant at $\alpha = 0.1$ level.

** the difference between two regions is significant at $\alpha = 0.05$ level.

Table 8. Average MASDR-Ratios in Asian and Western Regions

	Single vs. Married		Widowed vs. Married		Single vs. Widowed	
	Asia	West	Asia	West	Asia	West
Men						
35-44	3.30	2.54	3.73	3.59	0.89	0.70
45-54	2.60	2.18	2.34	2.65	1.16	0.81
55-64	2.19	1.87	2.05	1.83	1.22	1.02
65-74	2.38*	1.45*	1.33	1.50	1.83**	0.95**
Women						
35-44	4.05**	2.04**	1.84	2.10	2.09**	0.99**
45-54	3.43*	1.79*	1.58	1.60	2.12*	1.12*
55-64	3.36*	1.60*	1.55	1.40	2.61*	1.15*
65-74	3.73**	1.31**	1.14	1.29	3.55**	1.01**

* the difference between two regions is significant at $\alpha = 0.1$ level.

** the difference between two regions is significant at $\alpha = 0.05$ level.

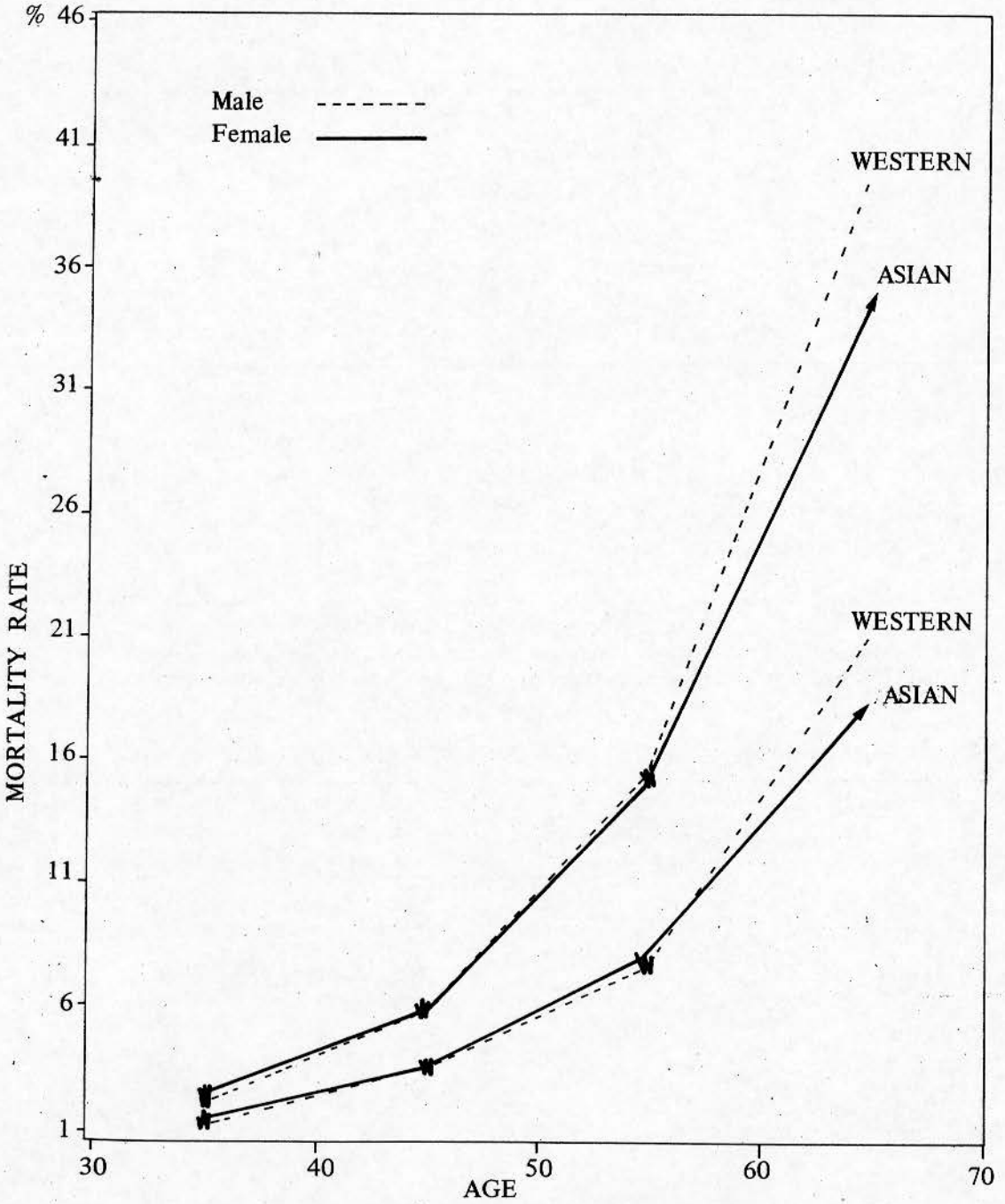


Figure 1. Mortality Rates of Married People in Asian and Western Regions

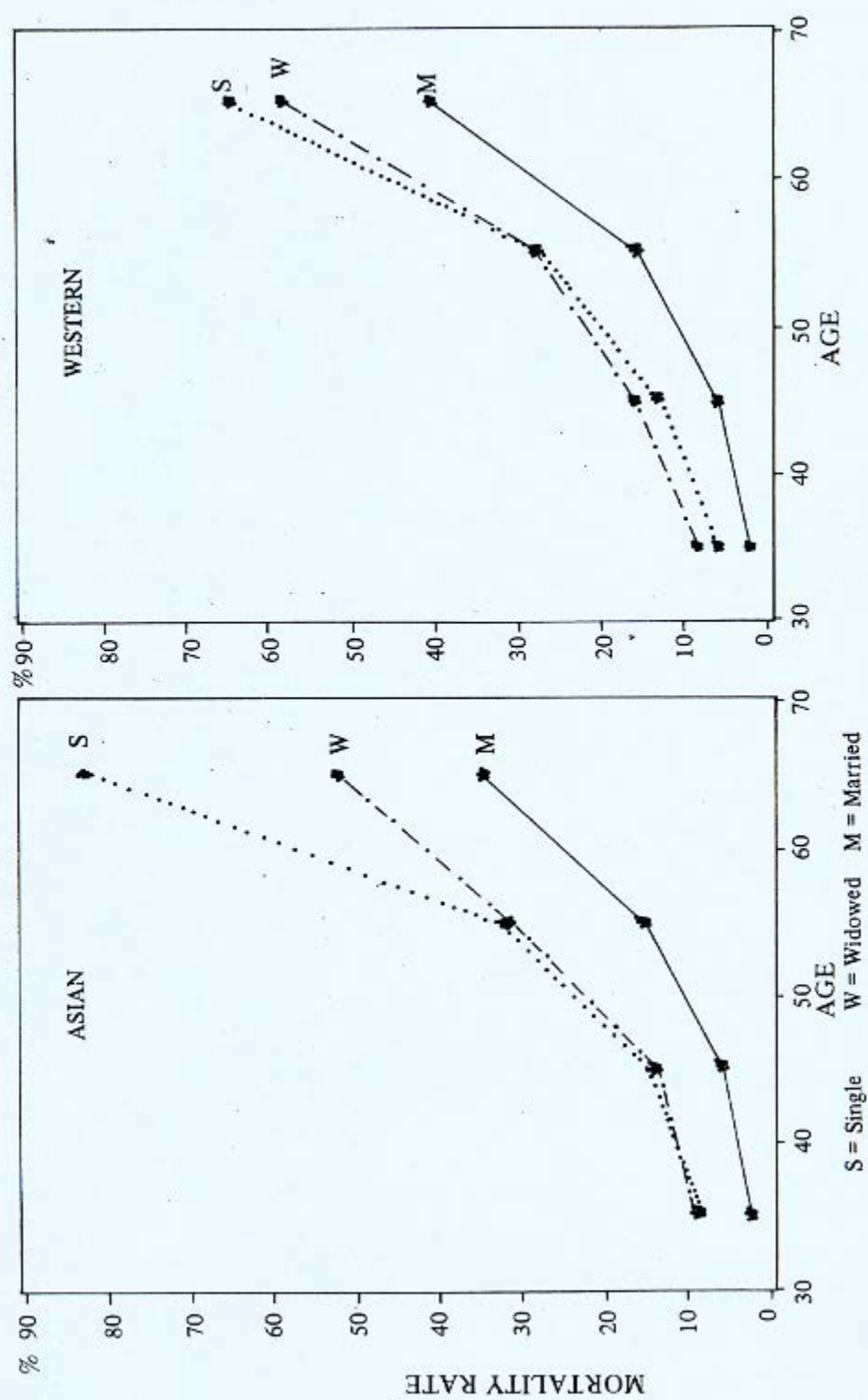


Figure 2. Mortality Rates of Males by Marital Status in Asian and Western Regions

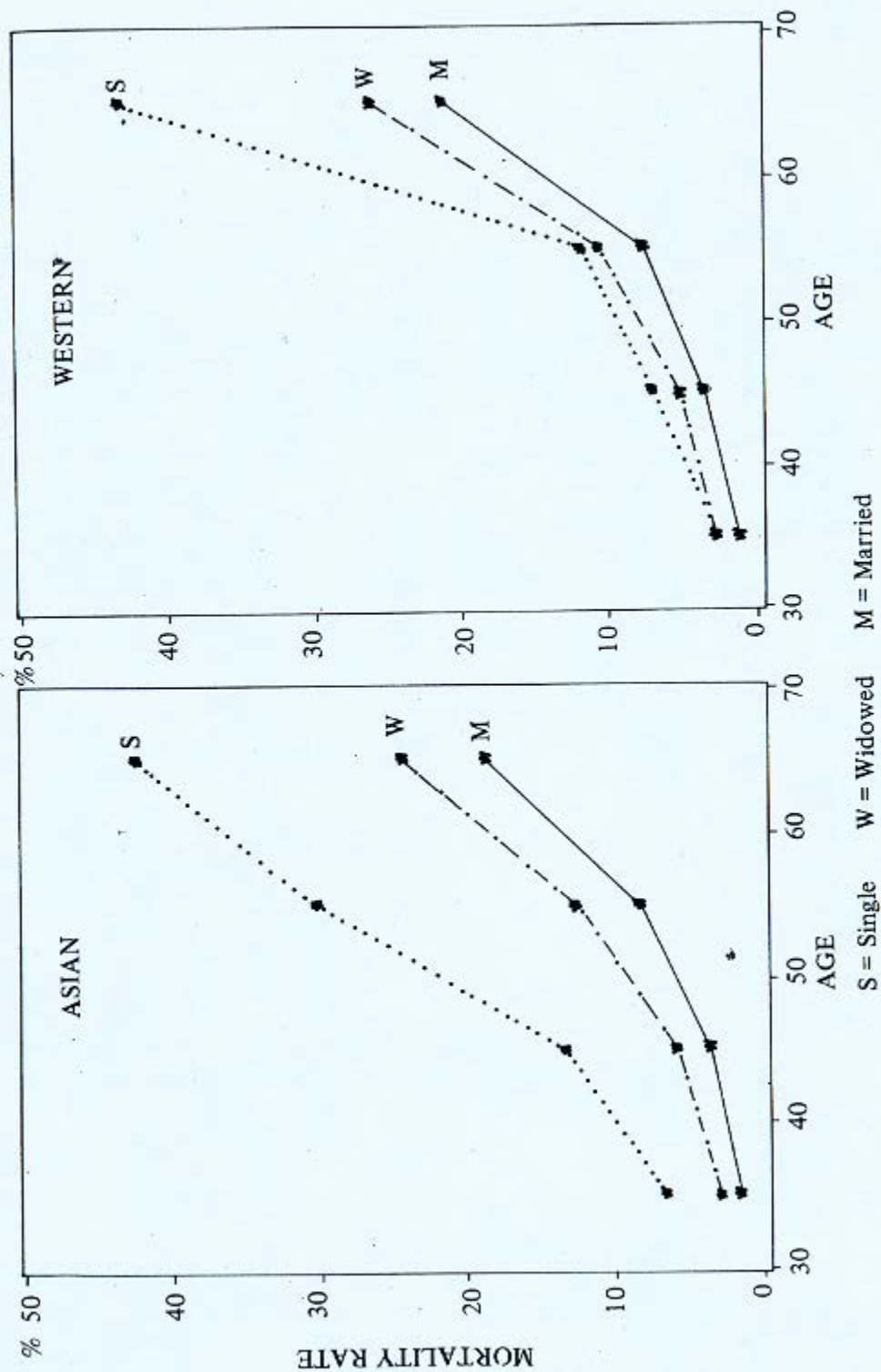


Figure 3. Mortality Rates of Females by Marital Status in Asian and Western Regions

never-married females in both regions have the highest level of mortality throughout all ages (ages 35-74). For male groups, mortality of the widowed exceeds only those of the never-married males at younger ages.

When the two cultural regions are compared, the most marked difference is the high mortality rates of never-married people in the Asian region. When the mortality differentials are expressed in ratio terms, the difference is more significant in the female's case. For example, as Table 8 shows, the average ratios of single versus married Asian females reach 4.05 at age 35-44 and 3.73 at age 65-74. In contrast to the Asian pattern, average ratios of single versus married Western females maintain only 2.04 at age 35-44 and 1.42 at age 65-74. This disparity is also illustrated in Figures 4 and 5.

A comparison of mortality rates and ratios between Asian and Western countries indicates that mortality patterns of married and widowed people are similar in these two regions. However, the mortality rate of never-married Asian people, especially of Asian females, is much higher than their Western counterpart. The differential patterns may reflect certain cultural influences which distinguish these two macro-cultural regions. Unfortunately, the available official mortality statistics do not reveal the proportion of excess deaths of never-married Asian males and females due to misreporting (or undercounts) and the proportion due to cultural influences.

V. Trends in Mortality Differentials between Asian and Western Countries

The marked difference in the never-married mortality rates between Asian and Western regions in current mortality conditions indicates that culture might play an important role in this disparity. Theoretically, it should also be important to identify the trend of such cultural disparity and to determine whether the differences diminish or persist over time. The inquiry also tests two contradictory arguments – cultural convergence and cultural adaptation⁽⁸⁾ – regarding the persistence of culture in the

(8) Most modernization theories (e.g. Lerner, 1964; Inkeles and Smith, 1974; Kerr, 1960) assert that global industrialization worldwide reduces cultural diversity and leads to a universal modern culture and social structure, while cultural adaptation model (Cole, 1973; Singer, 1980; Plath, 1980) argues that particular cultural solutions which were successful in the past will integrate into the current mode of adaptation.

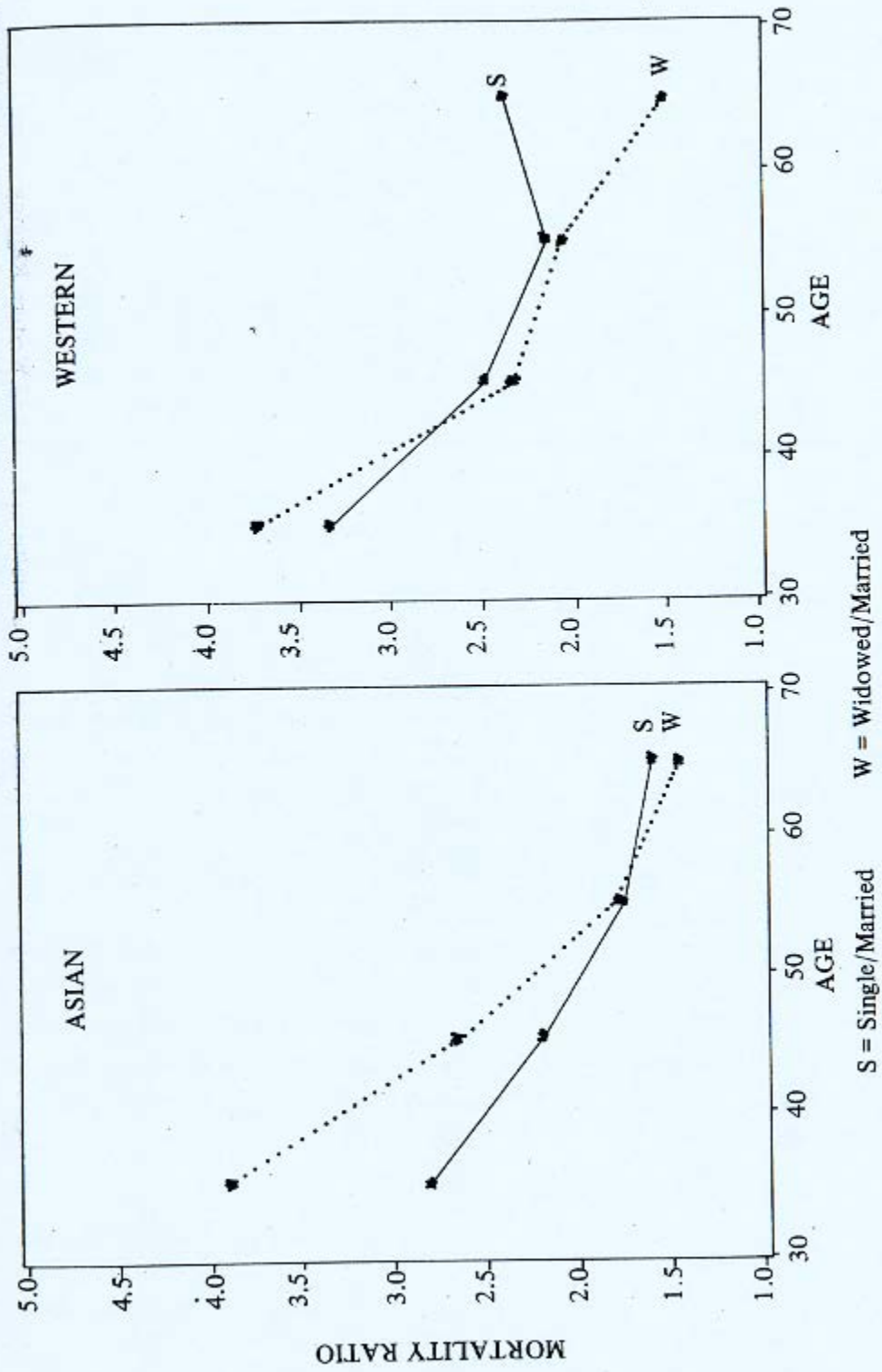


Figure 4. Mortality Ratios of Males by Marital Status in Asian and Western Regions

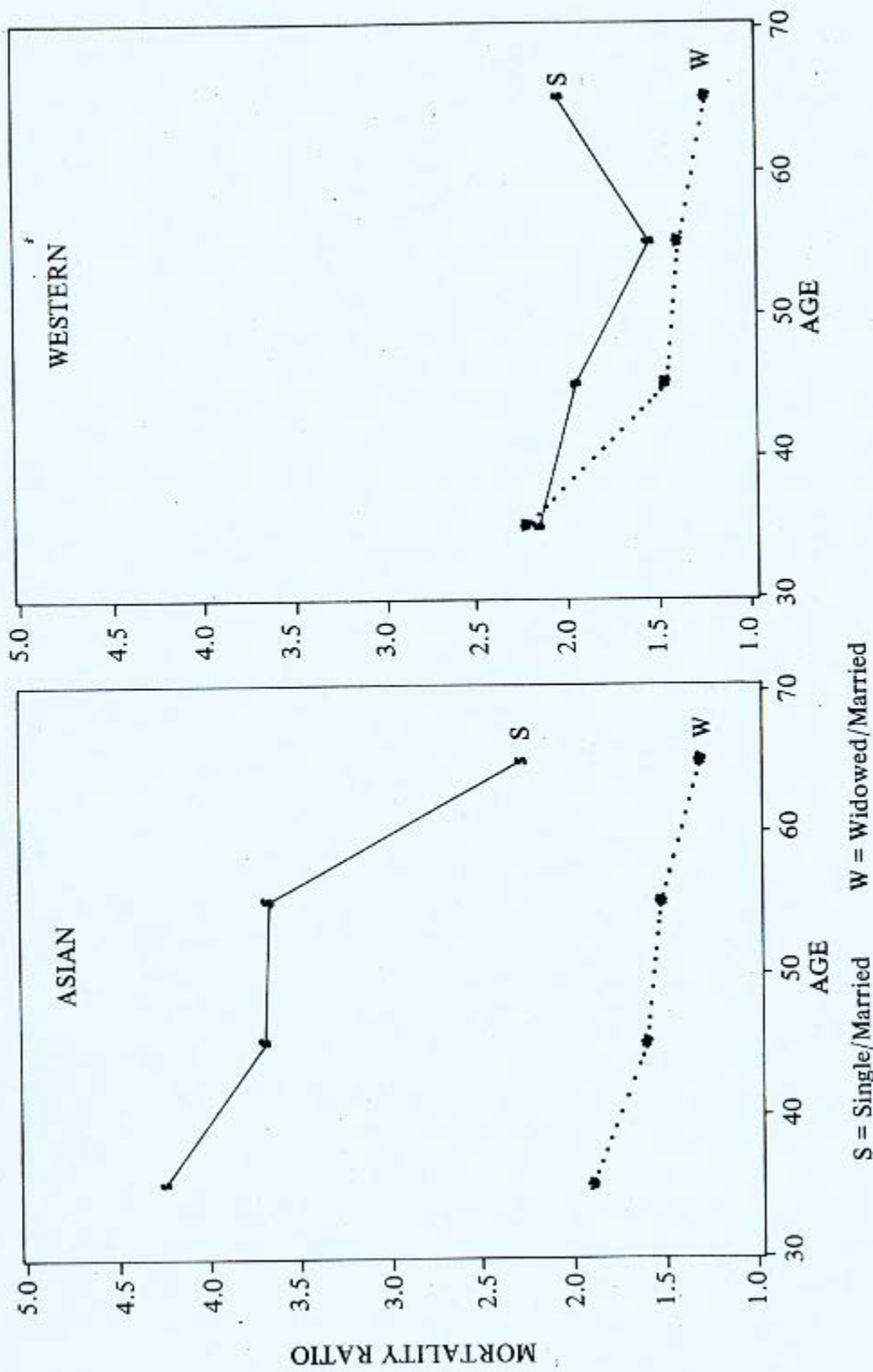


Figure 5. Mortality Ratios of Females by Marital Status in Asian and Western Regions

process of modernization.

Longitudinal information, (from 1960 to 1980) on mortality by age, sex and marital status of selected countries has been published in a series of special reports in the United Nations Demographic Yearbook (1968, 1974, and 1980). In these reports, Japan is the only Asian country with longitudinal information. In the Western cultural region, four countries were selected for comparison: Canada, the United States, France and Portugal.

In Figures 6 and 7, trends in mortality ratios for single versus married persons of the five countries in the two regions since 1960 are illustrated. For the young male groups, there is a clear convergence trend between Asian (Japan) and Western groups. Although the ratio for Japan has dropped since the 1960, it remains high. Western countries, on the other hand, had low ratios (below 1.5) in the 1960s and have increased slightly over the years 1960 to 1980. The convergent pattern, however, is not clear in older male groups. The trend is mixed, particularly in Western countries. For the female population, mortality ratios in Japan persist over these years and there is stability in both younger and older groups. Although there is a slight increase in the familial protective effect in Western countries, the pattern toward convergence is not clear.

SUMMARY AND DISCUSSION

The analysis of marital mortality differentials in eleven low-mortality countries confirms earlier findings in Western countries that married people have lower mortality rates than unmarried groups and the Unmarried/Married ratio for males is higher than the ratio for females. This finding is consistent with the general familial protection thesis presented by Gove's recent findings on mortality in the United States.

When developmental factors are examined, it is found that neither life expectancy nor national per capita income level has a significant impact on the marital mortality differentials of these countries. The result, thus, does not support Durkheim's predictions of decreasing familial protection in times of social change. These facts and the discoveries made in the analysis of variance on MASDR, which shows that

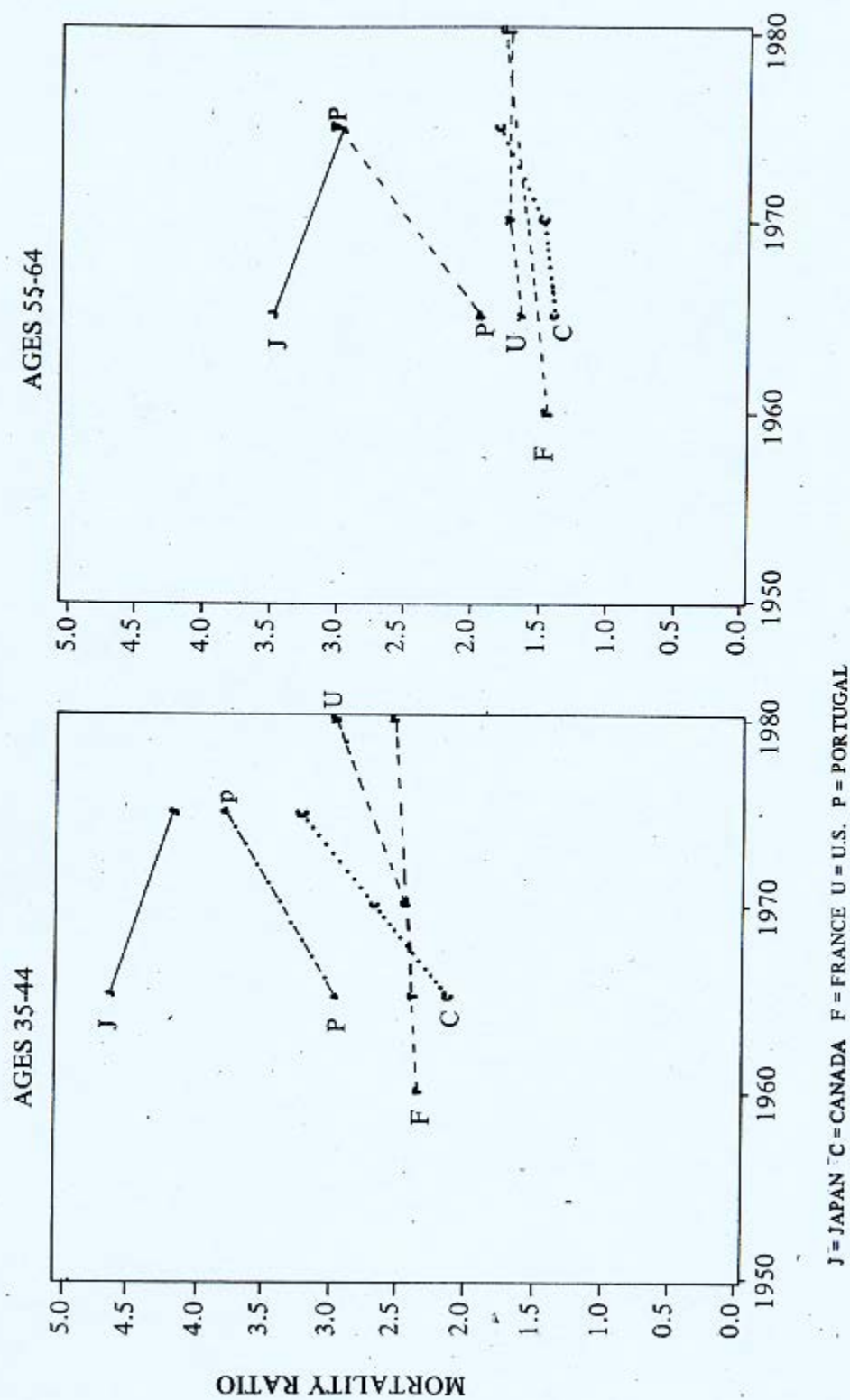
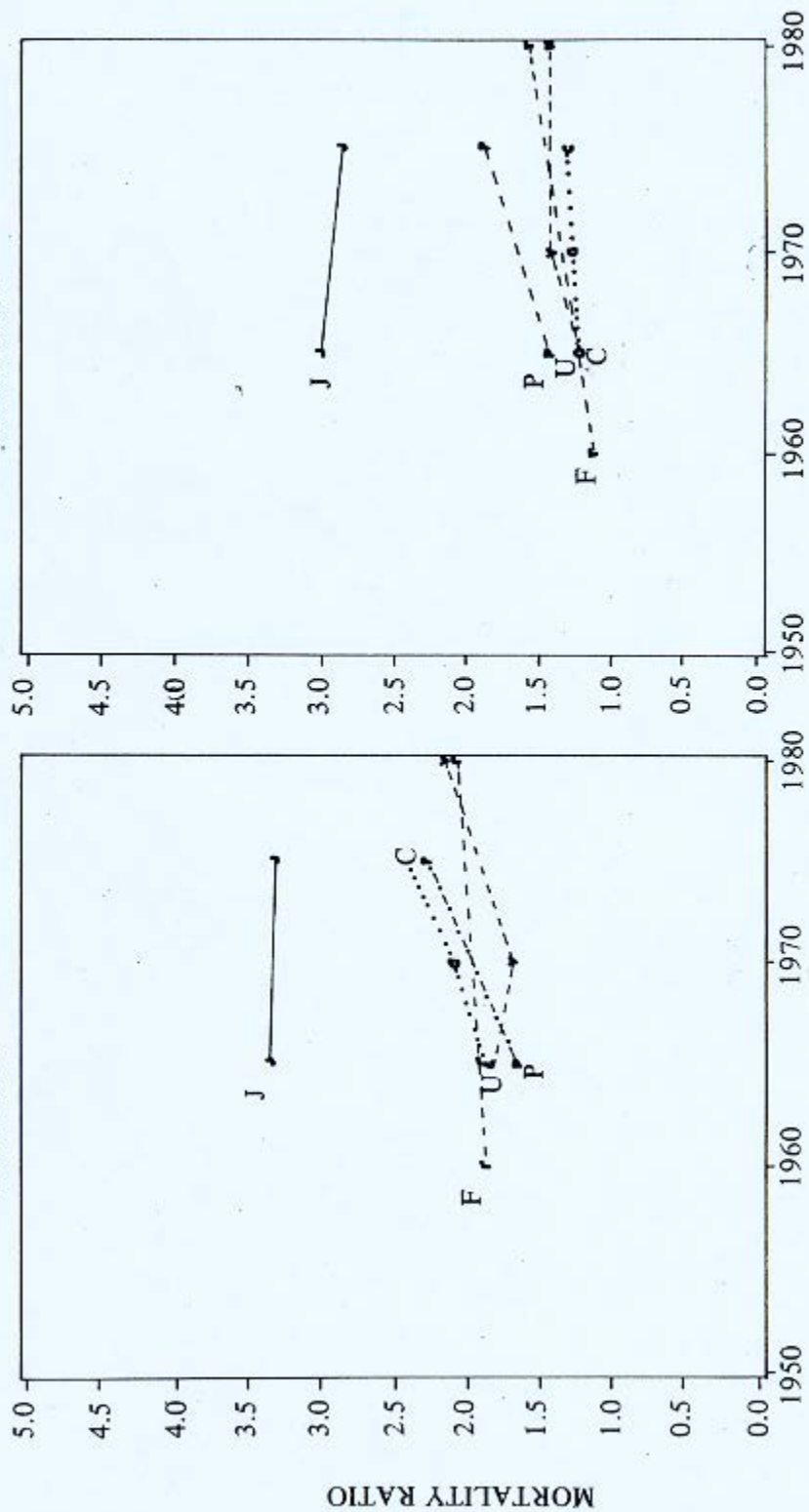


Figure 6. Longitudinal Trend of Mortality Ratios in Single vs. Married Males in Asian and Western Regions

AGES 35-44

AGES 55-64



J = JAPAN C = CANADA F = FRANCE U = U.S. P = PORTUGAL

Figure 7. Longitudinal Trend of Mortality Ratios in Single vs. Married Females in Asian and Western Regions

cultural regions have a significant effect on MASDR, suggest that cultural factors can be a powerful alternative approach in studying patterns and variations of MASDRs among low-mortality countries.

Detailed examination of mortality patterns in different cultural regions indicates that, although mortality rates of married people are similar in both Asian and Western regions, the rates for single people are markedly different. The mortality rates of single people, especially of single women in the Asian regions, are strikingly high. The excess deaths in this particular marital group were even higher in the past two decades. Despite a slight convergent trend of mortality differentials between single Asians and single Western groups, the differences between these marital groups are still distinctive.

This examination of marital status mortality differentials across cultural regions suggests strongly that culture may play an important role in determining mortality risks of people with different marital and/or familial status especially of those in the never-married population. Does the extraordinarily high mortality risk of single Asian women (compared with their Western counterparts) indicate that the Asian culture provides less social support for the never-married women than does the Western culture? What are these cultural mechanisms? Or does the phenomenon merely reflect that the marriage selection process for women operates differentially in Asian and Western cultures?⁽⁹⁾ Although this study cannot provide the answers for these important sociological questions, we suggest that more theoretical works on this issue should be examined and developed for further empirical investigation.

(9) One of the sharpest contrasts of nuptiality between European and Asian countries is the difference of the prevalence of lifelong abstention from marriage. Celibacy characterizes a significant proportion of the population of advanced age of each sex in European societies (Hajnal, 1965: 101-6) but is a rare phenomenon throughout most of the Asian countries (Dixon, 1971; Smith, 1980).

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低死亡國家的婚姻別死亡率差型態之研究

胡 幼 慧*

(中 文 摘 要)

* 本研究在探討 11 個低死亡國家的婚姻別死亡型態。根據 1980 年聯合國的資料顯示，未婚者（包括單身及喪偶者）之死亡率均高於已婚者，經由進一步分析顯示東西方文化區域之婚姻別死亡型態有顯著差異，而發展因素卻未造成顯著影響。東西方的差異主要存在於東方單身人口（尤其是單身女性）的偏高死亡率，此偏高現象在近二十年來有降低的趨勢，然而其差距仍十分明顯。以上結果基本上支持了“家庭保護功能”說，然而造成文化區域差異之原因屬家庭保護功能之差異亦或婚姻選擇力之差異尚待進一步探討。

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PATTERNS OF MORTALITY DIFFERENTIALS BY MARITAL
STATUS IN LOW MORTALITY COUNTRIES

(ABSTRACT)

This study examined mortality differentials by marital status in 11 low-mortality countries. The results show that, in general, unmarried populations have a higher mortality rate than that of married population. A more detailed analysis indicates that each country has its distinctive marital mortality features which are associated with cultural regions (East and West) but are not related to developmental factors. When marital mortality patterns of the East and the West are compared, it demonstrates that mortality rates of never-married Asian women are strikingly higher than that of their Western counterparts. This phenomenon has persisted during the last two decades. Two possible cultural interpretations are suggested: differential family support versus differential marital selection.