HAPPY LIFE EXPECTANCY IN 5 EUROPEAN COUNTRIES

A.E. Kunst[1)], P.T. Okma-Keulen[2)], R. Veenhoven[2)]

Paper prepared for presentation to the WG 06, Session 8: Quality of life in transnational comparisons (II) at the XIII World Congress of Sociology Bielefeld, Germany, July 18-23, 1994.

SUMMARY

Background
The livability of countries is often measured by the life expectancy of its citizens. At high levels, however, life expectancy might lose its usefulness as an indicator of livability, because a further increase of length of life might be attained at the price of more health problems and lower well-being at old age. Composite measures such as 'healthy life expectancy' have been used to assess whether gains in life expectancies are offset by decreasing levels of health. This paper explores the analogous concept of 'happy life expectancy'.

Data and methods
Data on the prevalence of happiness by age and sex were extracted from two international surveys: the Eurobarometer survey (with data on life satisfaction) and the European Value Study (with data on the ABS). Life tables and life satisfaction data were combined in order to calculate the happy life expectancy of men and women in five countries: Ireland, the UK, the Netherlands, France, and Greece.

Results
There is no generalised decline in life satisfaction at (very) old age. A small decline was observed only in the countries with the highest life expectancies. In all these countries, that age-related decline in life satisfaction was larger for women (who live longer) than for men.

Despite the lesser life satisfaction of old women, women do not only live longer than men, but they can also expect to live much more years in happiness. This applies to both the entire adult life (life after the 15th birthday) and to old age (life after the 65th birthday).

[1)] Department of Public Health Faculty of Medicine and Health Science
[2)] Department of Sociology Faculty of Social Science

Correspondence: Prof. Dr. Ruut Veenhoven Erasmus University Rotterdam, Faculty of Social Sciences, P.O.B. 1738 3000 DR Rotterdam, Netherlands. www2.eur.nl/fsw/research/veenhoven

No relationship between total and happy life expectancy was observed when comparing the five countries. Greek and French people have high life expectancies, but they live the smallest number of years in happiness. This is not due to a particular old age effect, but to low overall (all age) levels of life satisfaction.

Conclusion
Life at old age is not as gloomy as indicators of physical health suggest. The experience of women suggest that adding years to old age is likely to increase the number of years of life spent in happiness.

1 INTRODUCTION

Social indicators are generally used to monitor progress towards socially desired goals, either for nations at large or for specific subpopulations. The perhaps most comprehensive goal is phrased by old fairy tales which end by saying that 'they lived a long and happy life'.

The first element of this ideal, a long life, has given rise to the widespread use of life expectancy as a social indicator. Measured against this indicator, the last century has witnessed an enormous and unprecedented progress. Life expectancies in industrialised societies are now more than 70 years and in some cases even more than 80 years, as compared to less than 50 years until the mid 19th century. Some countries have made greater progress than others. Within the European Union, for example, male life expectancy at birth ranges from 70.8 years in Ireland to 74.1 years in Greece (women: from 76.4 in Ireland to 80.0 in France.

There is doubt, however, whether further gain in length of life will also involve a happy life. Since most deaths occur at ages above 65 years, an increase in life expectancy is principally reached by saving the lives of elderly. Life at old age, however, is fraught with problems related to physical health, such as pain, disability and dependency on aid. In addition, it has been argued that precisely those persons who are saved from dying, e.g. by postponing death from a chronic disease, are those who are bound to suffer from bad health during the rest of their life.

The concern about these issues has given rise to the sudden popularity of measures such as the healthy-life expectancy. The attractive feature of this type of measure is that it combines information on both mortality and the frequency of health problems into one single figure with a clear interpretation. In its broadest form, the healthy-life expectancy can be interpreted as the number of years that a person may be expected to live without physical health problems if that person would during the entire life time be exposed to the age specific mortality and morbidity rates that are observed now. This type of measure has been used to assess, among others, the question whether gains in life expectancies also implied an increase in the number of years in good health, or that these gains had just been achieved at the price of more years with physical health problems.

It would be incomplete and perhaps even misleading, however, to evaluate the currently high life expectancies mainly in terms of physical health. A more comprehensive view of the progress towards the goal of 'a long and happy life' would be obtained if life at old age is evaluated by indicators

that come closer to the idea of happiness. Thus, there is need for measures that, in analogy to the healthy-life expectancy, combine information on life expectancy with information on happiness during the years that are lived.

This paper introduces such a measure, the 'happy life expectancy', whose calculation and interpretation runs parallel to that of 'healthy life expectancy'. The usefulness of this new measure is explored by applying it to five countries of the European Union. These countries are: two large countries with contrasting life expectancies (France and the United Kingdom), the two countries with the lowest (Ireland) and highest life expectancies (Greece), and our own country (the Netherlands). Comparable data on the prevalence of happiness are obtained from two European-wide surveys: the Eurobarometer survey, which includes a question on satisfaction with life, and the European Value Study, which includes the Affect Balance Scale (ABS).

The following questions will be addressed:

1. Does according to data from these surveys happiness vary by age? More specifically, is there evidence for lower levels of happiness at (very) old age?
2. Is the age-related decrease in happiness more marked in countries with higher life expectancies? Similarly, is that decrease more marked among women (who live longer) than among men?
3. Have countries with high life expectancies also higher happy-life expectancies or are the extra years of life spent without happiness? Similarly, do women live more years in happiness than men?

2 MATERIAL AND METHODS

2.1 Material

The survey that we mainly used is the Eurobarometer survey, a nationally representative, continuous survey with about 2000 respondents per year per country. We pooled data over a 6-year period (1984-1989), so that large numbers of respondents were available for each country (about 12,000). This enabled us to study the prevalence of happiness for age groups as high as the group of 80+ years (about 150 respondents per country). The Eurobarometer survey contains a general question on satisfaction with life: "On the whole, are you very satisfied, fairly satisfied, not very satisfied or not at all satisfied with the life you lead?". The happiness measure that is applied below is the proportion of respondents that said that they were not very satisfied, or not satisfied at all. This prevalence measure is calculated per country, sex and 5-year age group, for all persons older than 15 years.

The satisfaction measure emphasizes the judgement of respondents with respect to their life. A complementary measure would be one that emphasizes the feeling or mood of respondents. Such a complementary indicator, the Affect Balance Scale (ABS), was available from another international survey, the European Value Study of 1980. The total number of respondents to this survey is much smaller than for the Eurobarometer survey, about 1200 per country. As a consequence, the prevalence of happiness for the age group 80+ years could only be studied by pooling the data from all countries together, whereas in country-specific analysis the 80+ years group had to be combined with the age group 75-79 years.

The ABS is a widely validated and much applied indicator of the prevalence of well-being in the general population. The ABS score is calculated from the responses to 10 questions. Five questions concern positive aspects of well-being (e.g. feeling proud, or feeling on the top of the world) and one point is added to the ABS score to each affirmative answer. In addition, five questions are asked on negative aspects (e.g. feeling lonely, or feeling bored) and one point is subtracted from the ABS score for each affirmative answer. If the respondent mentions as much positive as negative aspects, these two aspects balance out each other, and the ABS score is 0. If more negative aspects are mentioned the ABS is less than 0, else it is more than 0. The happiness measure that is applied below is the proportion of respondents with a negative ABS score. This prevalence measure is calculated per country, sex and 5-year age group, for all persons older than 15 years.

2.2 Methods

The happy life expectancy is calculated with the so-called Sullivan method, which is the most often used method for calculating the 'healthy life expectancy'. In short, this method starts with the calculation of the conventional life table. That life table determines for a birth cohort how many years will be lived at age=0, at age= 1 and so on until the upper age of, say, 100. The life expectancy at birth is calculated by, first, summing over all ages the number of years lived by that birth cohort and, then, by dividing this sum by the size of the cohort at birth. In our study, life tables were constructed for 1986, which is approximately the mid of the 6-year period for which Eurobarometer data were extracted (1984-1989).

The next step in the calculation of the happy life expectancy is to estimate the age-specific numbers of years lived in unhappiness. This is calculated as the product of (1) the total number of years lived in a specific age range according to the life table and (2) the proportion of persons in that age range that according to survey data are not happy (unsatisfied with life or, alternatively, with a negative ABS score). Again, these age-specific numbers are summed over all ages and then divided by the size of the cohort at birth. The resulting figure expresses the number of years that a person may be expected to live without happiness. Subtracting that number from the total life expectancy yield the happy life expectancy, that is, the number of years that a person may be expected to live in happiness.

(Happy) life expectancies cannot only be calculated for the entire age range (i.e. all ages after birth), but also for a restricted age range (i.e. all ages after a specific birthday). Since data on the prevalence of happiness were only available for the age groups 15 years and over, we calculated (happy) life expectancies at the 15^{th} birthday, that is, the number of years that one may still expect to live (in happiness) after having reached the 15^{th} birthday. In addition, we calculated the happy life expectancy at the 65^{th} birthday, which may be called the 'happy old age expectancy'.

3. RESULTS

3.1 Life expectancy

The first column of table 1 shows life expectancies by sex and country. The number of years that men may be expected to live after the 15th birthday ranges from 56.8 years in Ireland to 60.3 years in Greece. Women from all countries have higher life expectancies than their men. The lowest life expectancy is again found in Ireland (62.3 years) and the highest in France (65.8 years).

3.2 Life satisfaction

Figure 1 shows how the prevalence of low satisfaction with life varies by age, sex and country. A summary is given in table 1. There are large differences between countries in life satisfaction, with higher rates of dissatisfaction in southern countries. Within each country, differences between men and women are small.

The data do not suggest that life tends to become dissatisfying in old age. The prevalence of dissatisfaction is in fact slightly lower in the oldest age groups in most countries. There is neither evidence for a sudden bend to dissatisfaction in very old age.

Table 2 gives the same information as table 1, but then with a severer criterium of unhappiness, namely the proportion of people that say that they are not satisfied at all (thus excluding those who say that they are not very satisfied). The overall prevalence rates are of course lower than in table 1, but the pattern of variation by age, sex and country is similar.

3.3 Life expectancy and life satisfaction

There is no clear association between life expectancy and the life satisfaction: high levels of life satisfaction are observed in a country with high life expectancies (the Netherlands) as well as in a country low life expectancies (Ireland). This applies to life satisfaction at old age as well as to life satisfaction at younger age groups. Thus, overall levels of life satisfaction seem to be determined by more general factors that unrelated to life expectancy.

In the introduction, the hypothesis was mentioned that high life expectancies may have been achieved at the price of lower levels of well-being among the elderly. On the basis of this, one would expect that in countries with high life expectancies, the old fare less well and, as a consequence, they have lower levels of happiness than their younger compatriots. This possibility is examined in figure 2 by using the old/young ratio given in table 1. Indeed, comparisons of countries shows that there is a tendency for the relative disadvantage of the old to become larger with increasing life expectancy. In addition, in each country the age-related decline in happiness is larger among women (who live longer) than among men.

3.4 Happy life expectancy

Table 3 and figure 3 present estimates of happy life expectancy at the 15th birthday. The number of years that men can be expected to live in happiness ranges from 38.4 years in Greece to 53.9 years in the Netherlands (women: from 40.9 years in Greece to 60.3 years in the Netherlands).

In all countries, women do not only live longer, but thanks to their longer life they also are able to live more years in happiness.

The United Kingdom is in-between the Netherlands and Ireland not only with respect to the total life expectancy, but also with respect to happy life expectancy. A reversal occurs with respect to the position of France and in particular of Greece: despite the high life expectancies, people from these countries can be expected to live a smaller number of years in happiness. Since the low levels of happiness in Greece and France are observed for young as well as old ages, the low happy-life expectancies cannot be attributed to a particular old-age effect.

Table 4 and figure 4 present estimates of total and happy life expectancy at the 65th birthday. It may be expected that this restriction to the older age groups is able to show more clearly whether a longer life implies that a higher number of years is lived without happiness instead of happiness. Comparison of women to men does not suggest that. Women do not only live longer than men, but they can also expect to live much more years in happiness. Thus, although among women there is a stronger age-related increase in unhappiness than among men, that tendency cannot strongly reduce the happy life expectancy of old women.

The comparison of countries is again dominated by the reversal of the positions of Greece and France, which should be attributed to more general (all age) factors. The differences between Ireland, the UK and the Netherlands in total life expectancy are accompanied by differences of similar magnitude in happy-life expectancy.

3.5 The ABS score and indicators of physical health

Figure 5 presents some basic information on variation by age and by country in the negative ABS score, which can be considered a complementary measure of happiness. No data were available for Greece and Ireland. Instead, we included another mediterranean country, Italy.

The upper part takes the information from all countries together, which enabled us to study in detail how the prevalence of low well-being increases with age. A regular increase is observed, but not after the age of 80 years. The dip after the age of 80 years was also observed for each country individually.

The lower part of figure 5 compares the four included countries. As with life satisfaction, the highest prevalence of negative ABS and the sharpest increase with increasing age is observed for the southern countries.

Figure 6 is included in order to show with data from the Netherlands that the increase of low well-being (negative ABS score) with increasing age is modest as compared to the increase in the prevalence of physical health problems.

In conclusion, the more fragmentary data on ABS suggests that patterns of variation in low well-being by age and by country are approximately the same as with life satisfaction.

4. DISCUSSION

4.1 Data problems

We are at this moment exploring a number of data problems that have the potential to have biased patterns of variation in happiness by age, sex and country.

Non response
If non-response is higher among those with a low life satisfaction, that would cause a too positive estimate of the level of life satisfaction in the population. The major concern for this study is whether non-response rates in the Eurobarometer Study vary by age, sex or country. We are exploring the possibility that, e.g., the fairly high levels of life satisfaction at old age might to some extent be attributed to high non-response among the elderly.

Exclusion of the institutionalised population
People living in institutions (homes for elderly, psychiatric institutions, prisons etc) were excluded from the Eurobarometer Study. The numerically most important group are elderly living in institutions. If these people have lower levels of life satisfaction than elderly living on their own, their exclusion would cause a too positive view of happiness among the elderly. This effect can only be substantial at the oldest ages, where the proportion of the institutionalised population is large. Our main concern is the possibility that this might explain the finding presented in figure 6 that the prevalence of negative ABS scores does not increase beyond the age of 80 years.

Reporting bias
Their is obviously no more direct method to measure happiness than by asking people themselves. Unfortunately, responses to questions on happiness are not only determined by the judged or felt levels of happiness, but also by, e.g., the propensity to complain and the tendency to give socially desired answers. Studies on response bias reveal a slight tendency to present oneself as more satisfied than one actually is. This tendency seems somewhat more pronounces among the elderly and among women. As yet no cross-cultural differences in response bias have been identified. Although response bias may be involved, we feel that it is unlikely that it would have veiled massive unhappiness among the aged.

4.2 Happy life expectancy: interpretation

The main virtue of the happy life expectancy is that it summarizes information on quantity and quality of life into a single figure with a clear interpretation: the number of years after birth (or a certain birthday) that one can expect to live in happiness. However, a number of caveats should be kept in mind when using this measure.

Not a cohort measure
The measure summarizes the mortality level and prevalence of happiness in one period. To that end, it assumes that a hypothetical birth cohort would be exposed to the age specific death rates and happiness prevalence rates observed for that moment in time. It should be stressed that this hypothetical birth cohort does not represent the life-time experience of any real birth cohort. Instead, one can be fairly sure that the (happy) life expectancy estimate for one period differs from the life-time (past and future) experience of any of the birth cohorts that live by then. There may even be a temporal rise in mortality and decrease in happiness levels, e.g. because of war, that is

reflected in a happy life expectancy that is much lower than any real birth cohort would experience over its entire life-time.

Not a sequential order
It is tempting to interpret happiness and unhappiness in a sequential order, that is, to assume that the years in happiness are experienced first and that unhappiness is concentrated in the last part of life. Although this may be an approximately right interpretation in the case of physical health, our results showed that unhappiness is not a special fate of the elderly, but that periods of unhappiness can be expected to be passed through at young age as well as at old age.

Not one definite level of happiness
The calculation of the happy life expectancy requires a simple distinction between those who are considered to be 'happy' and the 'unhappy', whereas in reality the difference is much more fluid. It is important to recognise that the estimate of happy life expectancy depends very much on the criterium by which a person is considered to be happy or not. If both moderate and high levels of happiness are included, a large proportion of life is assumed to be spend in happiness, and the estimate of (variation in) happy life expectancy is close to that of total life expectancy. If, on the other hand, only high levels of happiness are included, happy life expectancy estimates would be much lower than estimates of the total life expectancy, and there is more room for discrepancies between the patterns for the two types of life expectancies. Therefore, the definition of the 'happy' category should always be recognised when happy life expectancy estimates are interpreted.

4.3 Happy life expectancy: applications

This explorative study showed two possible applications of happy life expectancy estimates.

Assessment of the livability of societies
Greece and, to a lesser extent, France are examples of populations where a high life expectancy is not accompanied by high levels of happiness, and for which the happy life expectancy estimates suggest that the livability is not better than at, e.g., the British Isles. In a similar way, the happy life expectancy can be used to identify groups within nations (areas, social classes, ethnic groups) where despite a high life expectancy the livability is low. Studies of trends in happy life expectancy would be able to identify countries or groups where an increasing length of life is offset by a deterioration in the quality of life, and thus where despite increasing life expectancies something seems to be going wrong.

When the happy life expectancy is intended to measure the livability of the living environment, it should be recognised that it inevitably encompasses all phenomena that exert an influence on the experience of happiness. This does not only include 'objective' living conditions related to the economy (e.g. living standards and economic security), socio-political factors (e.g. political and human rights), and the more proximate social environment (e.g. social control and support), but also includes factors of more cultural and mental

nature (e.g. expectations with respect to living conditions, and abilities to cope with unwanted living conditions).

Evaluation of policy measures

When the most comprehensive wish of people is to have a long and happy life, and when policy making within a democratic constitution is responsive to that wish, the happy life expectancy could provide an ultimate yardstick against which to evaluate policy measures. This applies in particular to policy measures which explicitly aim at extending life and at the same time aim at increasing the well-being of the aged. The most obvious case are policies with respect to medical care or, stated more broadly, health policies.

It is perhaps no wonder that a measure similar to the happy life expectancy has already been introduced in one terrain of health policy making: medical technology assessment. In this type of study, Quality Adjusted Life Years are used to evaluate the effect of the application of new medical technologies on the length and quality of life of specific patient groups. Application of this type of measure to the general population (as we did in this paper) may in the long run provide a quantitative base to health policy issues that affect populations at large. Examples of such issues are the questions whether to shift resources from cure to care (thus putting greater emphasis on improving quality of life), and whether to shift resources from the prevention and treatment of fatal diseases to prevention and treatment of non-fatal but painful or disabling diseases (thus, again, putting greater emphasis on improving quality of life).

The results of our exploratory analysis suggest that there is no simple answer to these questions. On the one hand, we found some support for the often expressed fear that extending life may go at the price of lower quality of life. On the other hand, the data give the impression that the old age is in general not as gloomy as indicators of physical health suggest. The experience of women (as compared to men) suggest that adding more years to life at old age might still be one way to come closer to the ideal of a long and happy life.

Table 1 The prevalence of low life satisfaction, by sex, country and age.

Sex / Country	Life expectancy at 15th birthday	% of respondents without satisfaction [a], by age			Ratio of 65-99 versus 15-64 year
		15-99	15-64	65-99	
Men					
Ireland	56.8	16.7	20.2	8.7	0.43
United Kingdom	58.4	15.0	15.3	14.7	0.96
Netherlands	59.0	8.9	8.8	9.2	1.05
France	57.7	25.6	27.7	20.5	0.74
Greece	60.3	36.0	36.3	35.6	0.98
Women					
Ireland	62.3	15.8	16.9	13.4	0.79
United Kingdom	64.0	15.6	14.6	18.0	1.23
Netherlands	65.6	8.3	7.6	10.0	1.32
France	65.8	28.7	28.8	28.4	0.99
Greece	64.8	37.4	35.4	42.1	1.19

[a] 'not very satified' or 'not satisfied at all' with the life one leads.

Table 2 The prevalence of *very* low life satisfaction, by sex, country and age.

Sex / Country	Life expectancy at 15th birthday	% of respondents 'not satisfied at all'			Ratio of 65-99 versus 15-64 year
		15-99	15-64	65-99	
Men					
Ireland	56.8	6.6	8.1	3.1	0.38
United Kingdom	58.4	4.5	4.4	4.7	1.07
Netherlands	59.0	2.5	2.6	2.1	0.81
France	57.7	6.8	7.6	4.9	0.64
Greece	60.3	14.0	14.0	14.1	1.01
Women					
Ireland	62.3	4.7	4.9	4.2	0.86
United Kingdom	64.0	3.6	3.6	3.7	1.03
Netherlands	65.6	2.3	2.3	2.3	1.00
France	65.8	6.8	7.1	6.2	0.87
Greece	64.8	14.9	13.5	18.4	1.36

Table 3 Number of years of life expected at the 15th birthday: total and in happiness (with satisfaction), by country and sex.

Sex / Country	Total life expectancy	Expected number of years without satisfaction		Happy life expectancy
		total	of which 'not satisfied at all'	
	(1)	(2)	(3)	(1)-(2)
Men				
Ireland	56.8	10.5	4.1	46.3
United Kingdom	58.4	8.9	2.6	49.5
Netherlands	59.0	5.1	1.4	53.9
France	57.7	15.2	4.1	42.5
Greece	60.3	21.9	8.5	38.4
Women				
Ireland	62.3	10.1	3.0	52.2
United Kingdom	64.0	9.8	2.3	54.2
Netherlands	65.6	5.3	1.5	60.3
France	65.8	19.0	4.6	46.8
Greece	64.8	23.9	9.4	40.9

Table 4 Number of years of life expected at the 65th birthday: total and in happiness (with satisfaction), by country and sex.

Sex / Country	Total life expectancy	Expected number of years without satisfaction		Happy life expectancy
		total	of which 'not satisfied at all'	
	(1)	(2)	(3)	(1)-(2)
Men				
Ireland	12.4	1.2	0.3	11.2
United Kingdom	13.8	2.1	0.7	11.7
Netherlands	14.1	1.1	0.3	13.0
France	14.7	2.9	0.7	11.8
Greece	15.4	5.7	2.3	9.7
Women				
Ireland	16.0	2.2	0.7	13.8
United Kingdom	17.8	3.2	0.7	14.6
Netherlands	18.9	1.9	0.4	17.0
France	19.2	5.6	1.2	13.6
Greece	17.7	7.5	3.3	10.2

Figure 1 The prevalence of low life satisfaction, by country and 5-year age group. Men (upper part) and women (lower part).

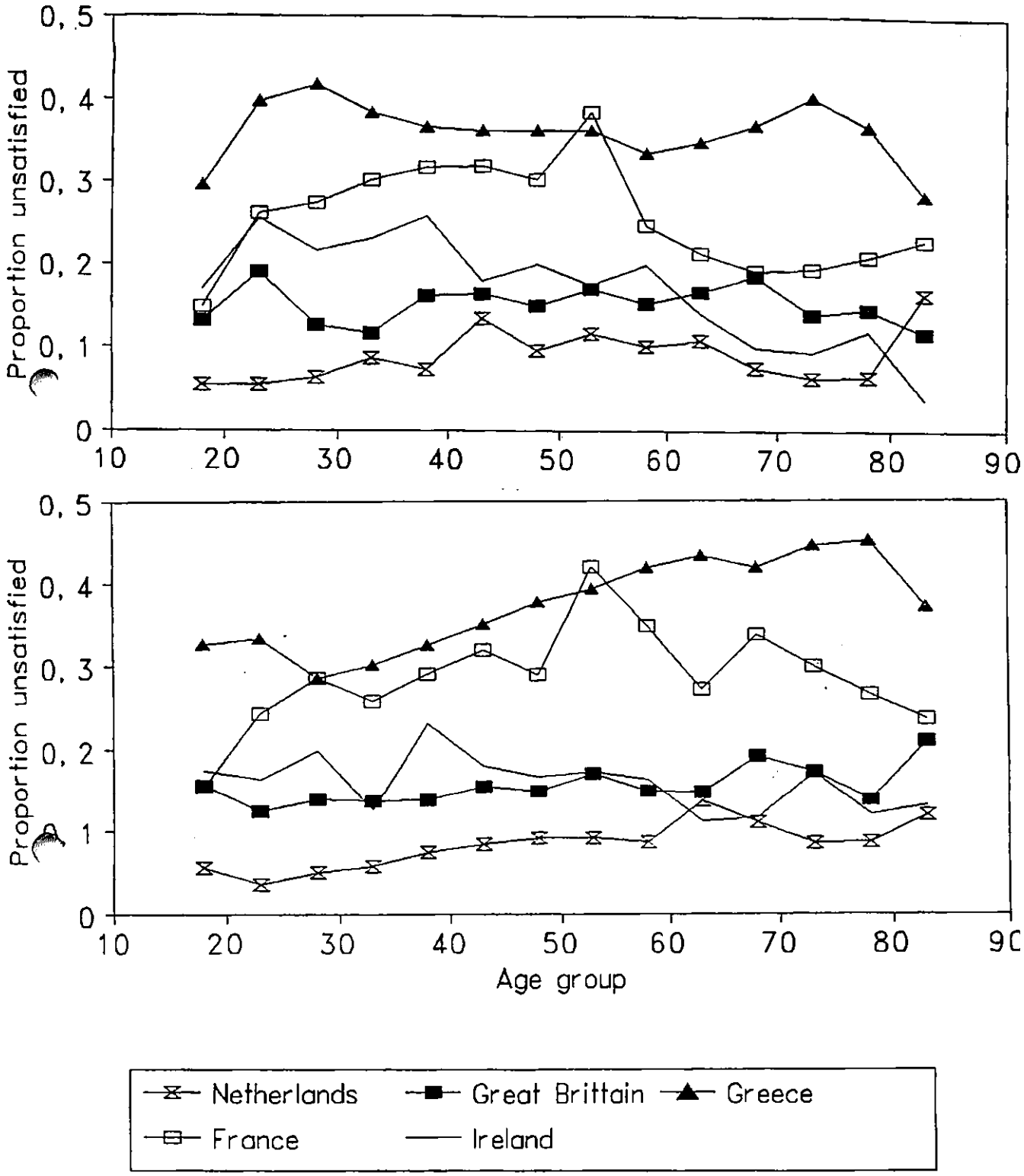

Figure 2 Life satisfaction of the elderly (65+ years) as compared to that of younger age groups: the association with life expectancy at the 15th birthday. The 5 countries and 2 sexes.

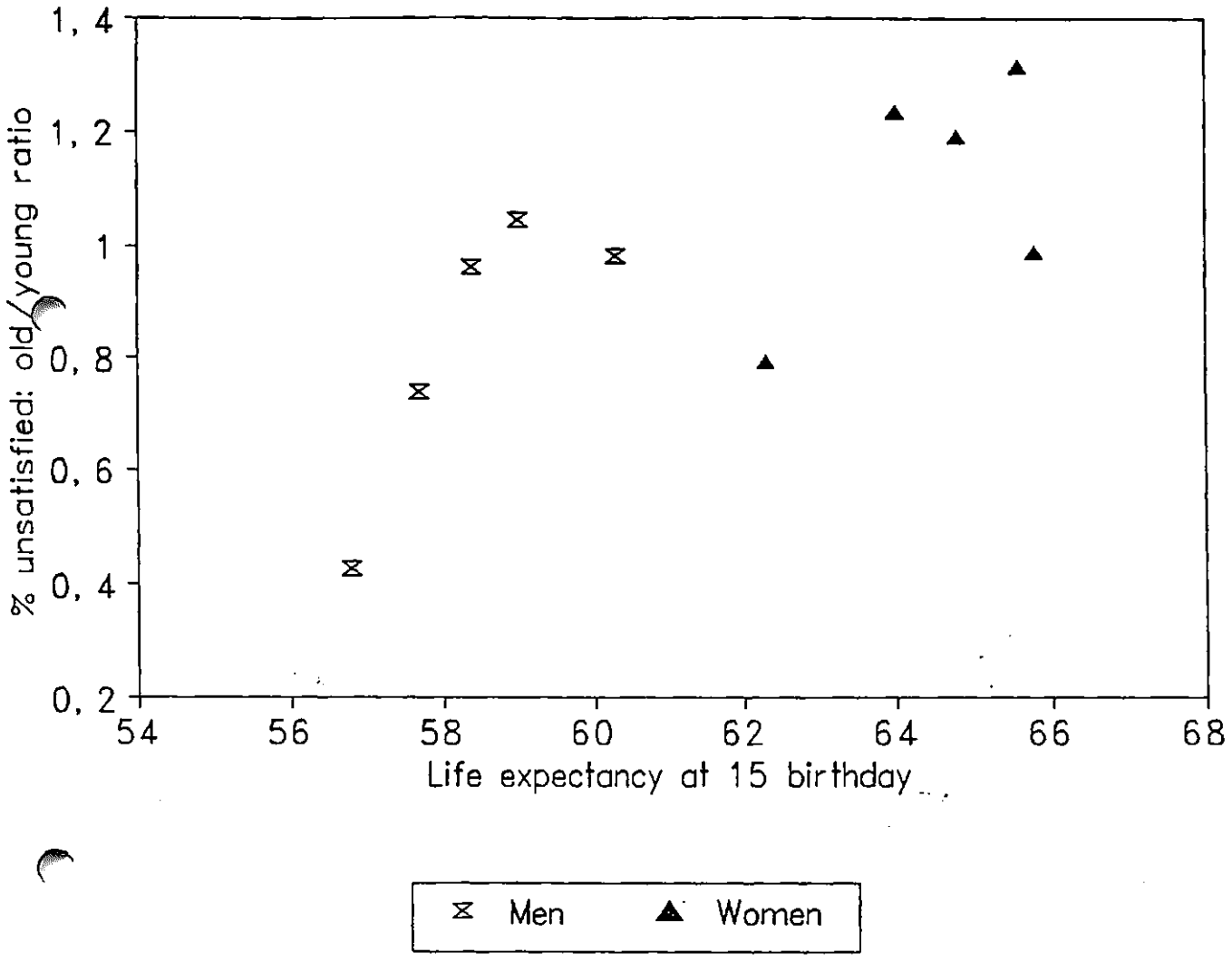

Figure 3 Number of years of life expected at the 15th birthday: total and in happiness (with satisfaction), by country and sex.

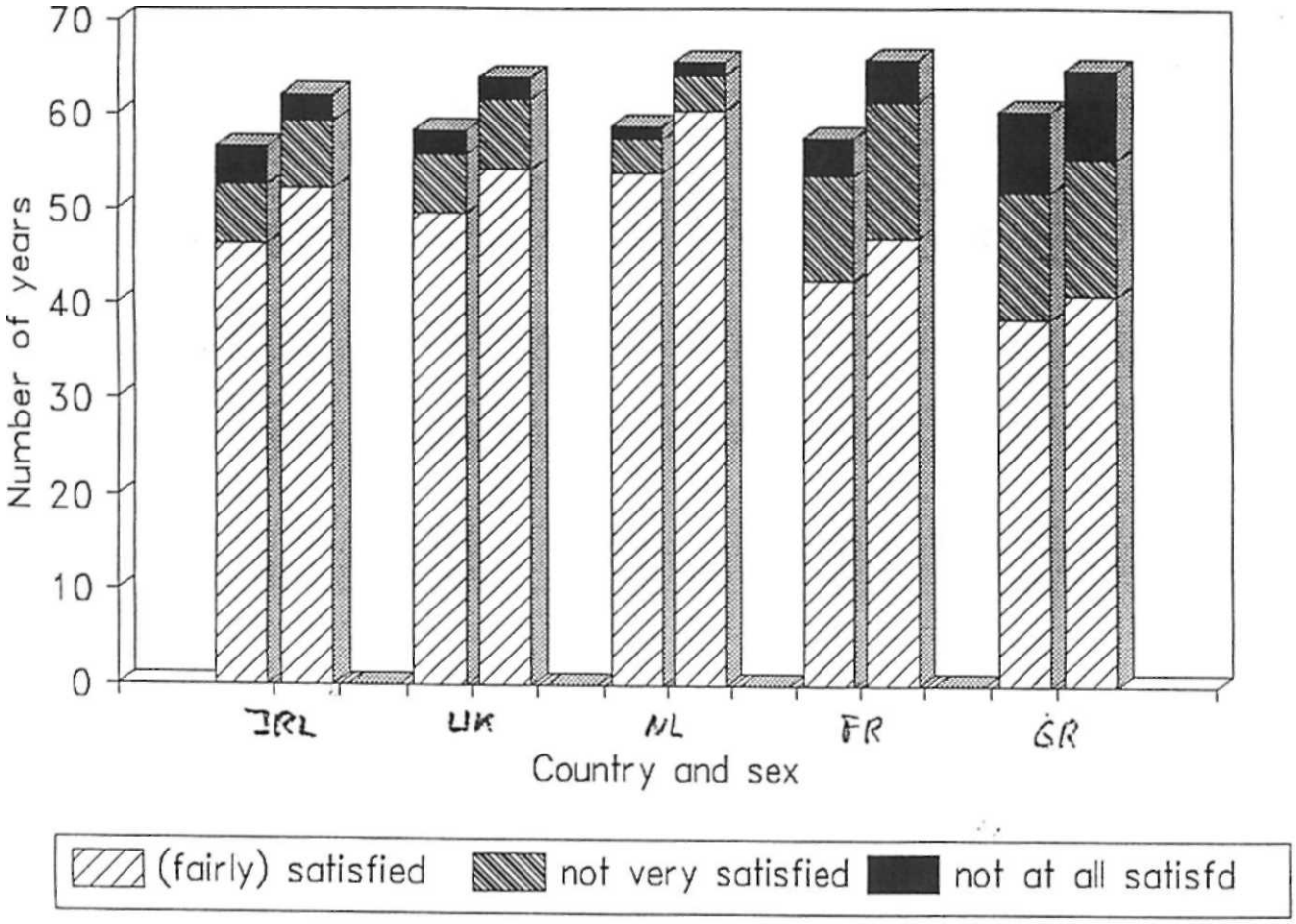

Figure 4 Number of years of life expected at the 65th birthday: total and in happiness (with satisfaction), by country and sex.

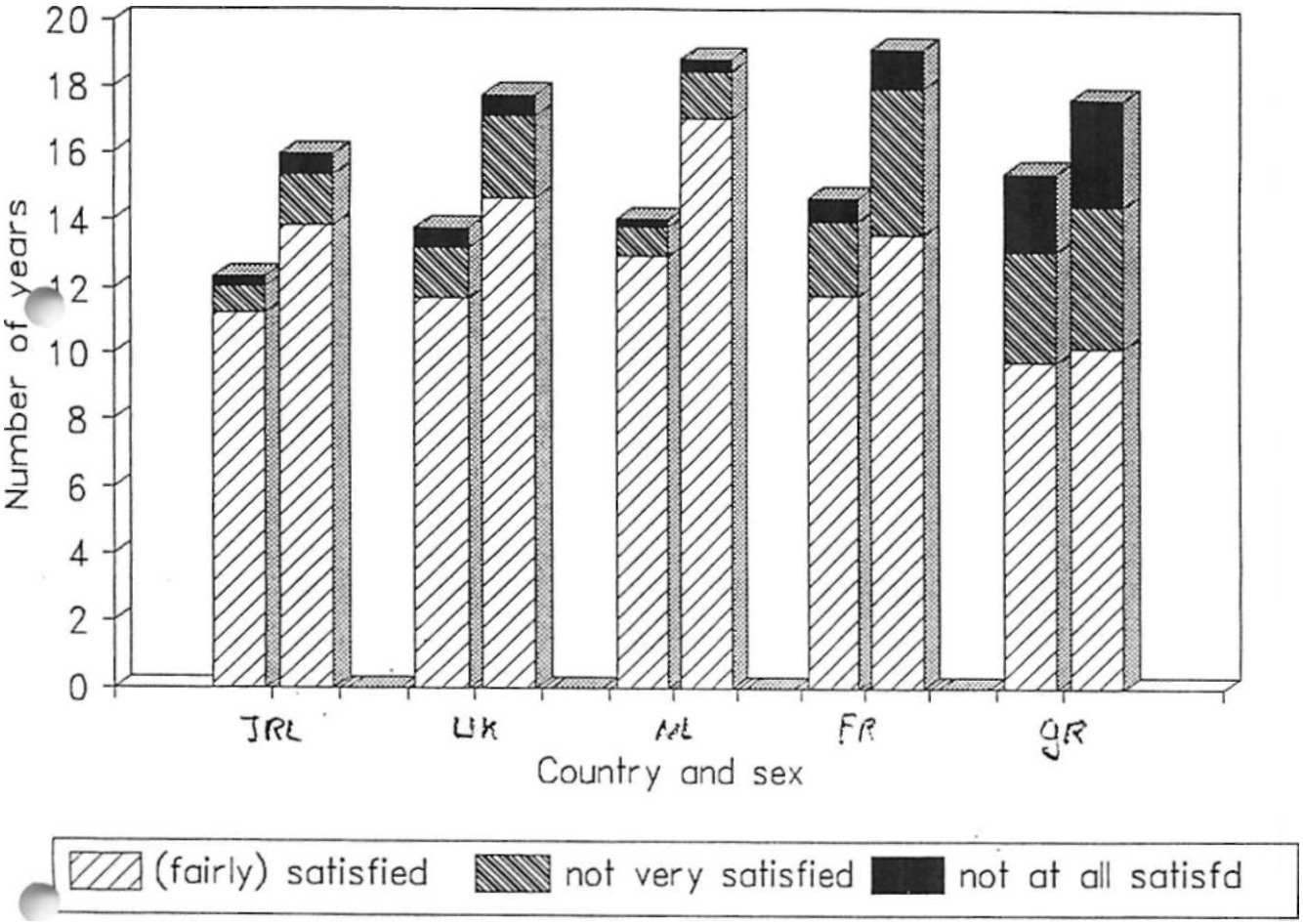

Figure 5 The prevalence of low well-being (negative ABS score) in 4 European countries. (A) All countries, by 5-year age group (B) Per country, by 10-year age group.

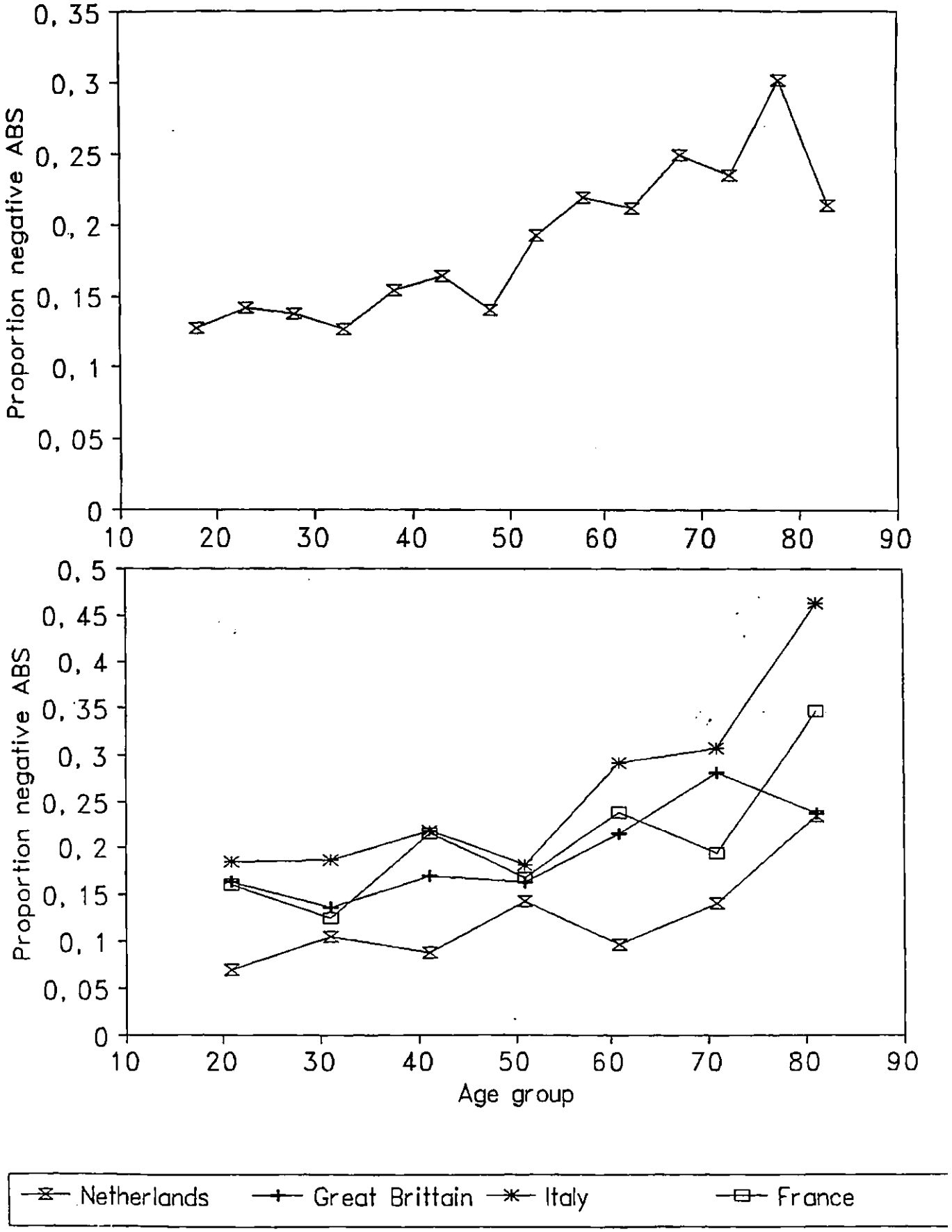

Figure 6 Changes in the prevalence of physical health problems and unhappiness by increasing age, the Netherlands, late 1980's. Indicators of physical health: poor (less-than-good) perceived general health; moderate difficulty with any Activity of Daily Life (disabled). Indicators of unhappiness: not (very) satisfied with life; negative ABS score