International Journal of Epidemiology
© International Epidemiological Association 1996

Vol. 25, No. 6
Printed in Great Britain

# Religious Affiliation and All-Cause Mortality: A Prospective Population Study in Middle-Aged Men in Eastern Finland

J RÄSÄNEN,* J KAUHANEN,* T A LAKKA,** G A KAPLAN† AND J T SALONEN*

Räsänen J (Research Institute of Public Health and Department of Community Health and General Practice, University of Kuopio, Kuopio, Finland), Kauhanen J, Lakka T A, Kaplan G A and Salonen J T. Religious affiliation and all-cause mortality: A prospective population study in middle-aged men in eastern Finland. *International Journal of Epidemiology* 1996; **25:** 1244–1249.

*Background.* Previous data suggest a favourable association between religion and mortality.

*Methods.* We investigated the association between selected religious groups and all-cause mortality in 1627 eastern Finnish men aged 42–60 years during 1984–1989 as a part of the Kuopio Ischaemic Heart Disease Risk Factor Study (KIHD).

*Results.* Eastern Orthodox men had a 5.1-fold (95% confidence interval [CI : 1.98–13.3, $P < 0.001$) mortality as compared with Lutheran men after adjusting for main confounders. Adjustment for different sets of covariates did not affect the magnitude of relative hazard (RH) notably. Adjusted for the examination year, age, family history of coronary heart disease (CHD), and ischaemia in exercise electrocardiograms, RH was 4.4 (95% CI : 2.5–7.5, $P < 0.001$) and 4.7 (95% CI : 2.7–8.3, $P < 0.001$) after an additional adjustment for serum cholesterol, blood leucocytes, plasma fibrinogen, serum triglycerides, maximal oxygen uptake, height, and weight. With adjustment for income, childhood socioeconomic status (SES), and years of education RH for the Orthodox religion was 4.2 (95% CI : 2.4–7.3, $P < 0.001$) and 4.4 (95% CI : 2.5–7.7, $P < 0.001$) with depression, helplessness, quality of relationships, marital status and organizational participation, and 4.1 (95% CI : 2.4–7.2, $P < 0.001$) when adjusted for the use of tobacco and alcohol and the intensity of physical activity. After adjustment for migration because of the war the RH was 4.5 (95% CI : 1.9–10.8, $P < 0.001$).

*Conclusions.* Our findings indicate that mortality risk varies substantially by religious affiliation, and this variation cannot be attributed to differences in measures for a wide variety of health, behavioural, socioeconomic, biological, social, and other characteristics.

*Keywords*: cohort study, mortality, men, population studies, religion

A few studies have examined differences in all-cause mortality by major religious denominations. An early study in New York showed lower all-cause mortality among Jews as compared with Gentiles.[1] Protestants in Germany may have longer life expectancy than Catholics.[2] Jews were at higher risk of myocardial infarctions than Gentiles[3] and Protestants were at greater risk of CHD than Catholics.[4] The incidence of coronary heart disease (CHD) was greater among Jews than Catholics,[5] Protestants,[6] or Gentiles[7] as a whole in America. Mortality from CHD varies with a nation's dominant religion. Among 24 economically developed Western nations predominantly Catholic countries have lower rates than more Protestant countries.[8] Catholic and Protestant countries differ, however, in many ways and it is impossible to establish causal links between religion and CHD mortality based on these ecological analyses.

Lower cardiovascular mortality has been observed among Mormons and Seventh-day Adventists than in the general population. In Utah Mormons had 35% lower mortality for CHD as compared with the whole of the US population while non-Mormons and the general population had no significant difference in CHD mortality.[9] Mormon men also had lower mortality from hypertensive heart disease and Mormon women from rheumatic heart disease than non-Mormons.

* Research Institute of Public Health and Department of Community Health and General Practice, University of Kuopio, Kuopio, Finland.
** Research Institute of Public Health, University of Kuopio, and Department of Medicine, Kuopio University Hospital, Kuopio, Finland.
† Human Population Laboratory, California Department of Health Services, Berkeley, CA, USA..
Reprint requests to: Professor Jukka T Salonen, Department of Community Health and General Practice, University of Kuopio, PO Box 1627, 70211 Kuopio, Finland.

Studies in the US,[10] Netherlands,[11] and Norway,[12] indicate that Seventh-day Adventists have a roughly 50% lower mortality from CHD than the general population. In a prospective study, California Seventh-day Adventists aged 35–64 years had a 28% lower, and those aged over 65 a 50% lower, CHD mortality as compared with the general population of the same age groups.[13] According to the Israeli Ischaemic Heart Disease Study, the 5-year incidence of acute myocardial infarction among secular Jewish men was 5.8%, 3.7% among traditional Jews, and 2.9% among the orthodox.[14] Those of 10 059 male Israeli civil servants and municipal employees who reported themselves as the most orthodox had a 20% lower probability of dying from CHD and all causes.[15] The incidence of non-fatal heart attack for secularized Jewish men was four and for women seven times higher than that of orthodox Jews[16] when adjusted for confounding factors.

In the Alameda County Study[17] church group membership was associated with lower mortality in both genders and in all age groups. Nominal membership, non-affiliation, or being atheist was associated with a non-significant higher risk for overall mortality as compared with active membership and practice.[18]

The aim of the present study was to investigate the association between selected religious affiliations and all-cause mortality in middle-aged men in eastern Finland, adjusting for numerous potential biological, social, psychosocial, behavioural, and confounding factors.

## SUBJECTS AND METHODS

### *Study Population*

The Kuopio Ischaemic Heart Disease Risk Factor Study (KIHD), a population study, addresses previously unestablished risk factors for CHD, carotid atherosclerosis, mortality, and related outcomes. The participants were a random sample of male inhabitants of the city of Kuopio and the neighbouring rural communities, stratified and balanced according to age. Participants were 42, 48, 54, or 60 years old at the baseline examination which took place between March 1984 and December 1989. Average follow-up time was 6.0 years (range 3.1–8.8). Out of the total 3235 invited eligible men 2682 (83%) took part. In the current analyses subjects who reported prevalent CHD or cancer (1042 men) were excluded since illness may influence religiosity,[19] particularly among older people.[20] Men with hypertension (811 men) were not excluded because of the large number of them. Complete data on religious affiliation were available for 1624 subjects.

Data on the following variables were missing for some men: depression, 47; total income, 26; intensity of conditioning physical activity, 118; serum high density lipoprotein (HDL) cholestrol, 80; blood leucocyte count, 12; plasma fibrinogen, 142; serum triglycerides, 50; maximal oxygen uptake, 170; height, 4; weight, 4. The missing value was substituted by mean value in all 1624 participants. Missing values in the categorical variables (hopelessness, 159; organizational participation, 14; quality of relations, 26; and quartiles of alcohol use, 1) were conservatively replaced by the low risk value.

### *Assessment of Religion*

Religious affiliation was ascertained by means of a self-administered questionnaire. The subjects indicated whether they were Lutherans, Eastern Orthodox, Mormons, Pentecostals, Jehovah's Witnesses, Revivalists, members of Free Church, or non-affiliated. Only the Lutherans, Eastern Orthodox, and non-affiliated were included in the study, others were excluded because there were fewer than 50 subjects in these groups altogether.

### *Assessment of Covariates*

The assessment of demographic variables, medical history, family history of diseases, smoking,[21] socioeconomic status,[22] conditioning leisure time physical activity, maximal oxygen uptake,[23] serum lipids and use of alcohol,[24] marital status, quality of relationships, organizational participation,[18] and hopelessness[25] have been described earlier. Depression was assessed by using a short form of the Minnesota Multiphase Personal Inventory (MMPI) scale.[26] Marital status, quality of relationships, depression, organizational participation, hopelessness and use of alcohol were entered as indicator variables to ensure the most complete possible control for their likely, even non-linear, confounding effects. Only those factors which associated with the risk were included in the models.

### *Assessment of Mortality*

All-cause mortality was ascertained by using the National Death Registry which maintains a record for all Finns. The present study cohort was linked with the death registry by using the national personal identification code (social security number). Deaths were classified according to the primary cause, reviewed at the National Centre of Statistics of Finland. All deaths were classified according to the Ninth Revision of the International Classification of Diseases (ICD).

### *Statistical Methods*

Associations between religious affiliation and mortality were examined using the Cox proportional hazards' model.[27] We used six different models consisting of various sets of covariates. All included age and the

examination year as five indicator variables. The models involved adjustment for biological, socioeconomic, psychosocial, and behavioural factors.

## RESULTS

Of all 1624 men, 1344 (84.0%) were Lutheran, 171 (10.6%) non-affiliated, and 85 (5.4%) Orthodox. The age of the subjects ranged from 42.0 to 61.2 years at baseline (mean 52.1). The total number of deaths by the end of 1994 was 98, of which 68 occurred among the Lutherans, 16 among the Orthodox, and 14 among the non-affiliated. Among the Lutherans 21 (31%) of the deaths were due to cancer, 20 (29%) to cardiovascular diseases, 15 (22%) to accidents, and 12 (18%) to other causes. For the Orthodox, the numbers were 4 (25%), 5 (31%), 6 (38%),1 (6%), and among the non-affiliated 3 (20%), 7 (50%), 2 (15%), 2 (15%) respectively.

Table 1 presents the relative hazards (RH) for the religious groups when six different sets of covariates were used, adjusted in all cases for age and year of examination. The RH for the Orthodox remained high and statistically significant in each set. The risk associated with being non-affiliated was also elevated throughout the sets but not significantly. When the variable concerning migration from Karelia was omitted from the model because of high correlation with Orthodoxy, the RH was 4.54 (95% confidence interval [CI] : 2.74–10.37, $P < 0.001$). When migration was included in the model without Orthodoxy it had a weaker association with death; the RH was 2.25 (95% CI : 1.26–4.00, $P < 0.01$).

The strongest risk factors for all-cause death in the three religious groups, adjusted for age and the years of examination are shown in Table 2. Number of pack years of cigarette smoking, maximal oxygen uptake, total consumption of alcohol, weight, blood leucocyte count, organizational participation, marital status, and the intensity of conditioning physical activity were also associated significantly with all-cause mortality.

TABLE 1 *Relative hazard (RH) for all-cause death in Eastern Orthodox and non-affiliated men as compared with Lutherans, adjusted for different sets of covariates, age, and examination years*

| | RH | 95% confidence interval | *P*-value |
|---|---|---|---|
| Set 1 Cardiovascular factors | | | |
| Lutheran (reference) | 1.0 | | |
| Eastern Orthodox | 4.36 | 2.52–7.55 | < 0.001 |
| Non-affiliated | 1.69 | 0.95–3.01 | 0.07 |
| Set 2 Migration | | | |
| Lutheran | 1.0 | | |
| Eastern Orthodox | 4.54 | 1.91–10.79 | < 0.001 |
| Non-affiliated | 1.69 | 0.95–3.05 | 0.07 |
| Set 3 Socioeconomic factors | | | |
| Lutheran | 1.0 | | |
| Eastern Orthodox | 4.19 | 2.40–7.31 | < 0.001 |
| Non-affiliated | 1.62 | 0.91–2.89 | 0.09 |
| Set 4 Psychosocial factors | | | |
| Lutheran | 1.0 | | |
| Eastern Orthodox | 4.39 | 2.50–7.70 | < 0.001 |
| Non-affiliated | 1.58 | 0.88–2.86 | 0.12 |
| Set 5 Behavioural factors | | | |
| Lutheran | 1.0 | | |
| Eastern Orthodox | 4.14 | 2.38–7.20 | < 0.001 |
| Non-affiliated | 1.42 | 0.79–2.55 | 0.23 |
| Set 6 Biological factors | | | |
| Lutheran | 1.0 | | |
| Eastern Orthodox | 4.74 | 2.70–8.32 | < 0.001 |
| Non-affliated | 1.49 | 0.76–2.46 | 0.28 |
| Set 7 All factors | | | |
| Lutheran | 1.0 | | |
| Eastern Orthodox | 5.12 | 1.98–13.27 | < 0.001 |
| Non-affiliated | 1.27 | 0.69–2.33 | 0.43 |

Covariates in the sets
Set 1: Family history of coronary heart disease, ischaemia in exercise electrocardiograms.
Set 2: Migration because of the war.
Set 3: Total income, childhood socioeconomic status, years of education.
Set 4: Depression, hopelessness, quality of relationships, marital status, organizational participation.
Set 5: Intensity of physical activity, use of alcohol, cigarette years.
Set 6: Serum high density lipoprotein cholesterol, leucocyte count, plasma fibrinogen, serum triglycerides, maximal oxygen uptake, height, weight.
Set 7: All covariates together.

## DISCUSSION

The Lutheran state church dominates the religious scene in Finland with most Finns (88%) being members. For many, membership is an integral part of the Finnish way of life and there are strong cultural ties between the church and society. The Orthodox (1%), members of various denominations (1%), and non-affiliated (10%), constitute the rest.[28]

Mortality patterns seem to vary among adherents of different denominations[29] although the results have been somewhat incongruent.[30] According to our findings Eastern Orthodox men have considerably higher all-cause mortality than the Lutheran men in eastern Finland. They *exhibit* higher mortality than the general population, i.e. the Lutherans. In this respect the results contradict many previous studies which have observed

TABLE 2 *Risk factor distributions among Eastern Orthodox, Non-affiliated, and Lutheran men*

| | Lutherans N = 1344 Mean ± SD or proportion | Eastern Orthodox N = 85 Mean ± SD or proportion | Non-affiliated N = 171 Mean ± SD or proportion | Between groups *P*-value |
|---|---|---|---|---|
| Age (in years) | 52.1 ± 5.5 | 52.6 ± 4.8 | 52.5 ± 4.9 | n.s. |
| Family history of CHD[a] (%) | 43.9 | 44.7 | 46.3 | n.s. |
| IHD[b] in exercise test (%) | 15.2 | 19.9 | 16.9 | n.s. |
| Migrated because of the war (%) | 6.7 | 90.4 | 12.9 | < 0.001 |
| Total income (FIM) | 85 945 ± 56 599 | 78 154 ± 47 044 | 78 897 ± 49 352 | n.s. |
| Childhood socioeconomic status[c] | 2.75 ± 1.44 | 2.72 ± 1.40 | 2.98 ± 1.43 | n.s. |
| Years of education | 9.0 ± 3.6 | 8.4 ± 3.4 | 8.7 ± 3.2 | n.s. |
| Quality of relationships (score) | 7.2 ± 1.3 | 7.1 ± 1.2 | 7.1 ± 1.3 | n.s. |
| Organizational participation (score) | 3.1.± 2.8 | 2.3 ± 2.5 | 2.7 ± 2.5 | < 0.01 |
| Hopelessness | 2.5 ± 1.9 | 3.0 ± 1.8 | 2.5 ± 1.9 | n.s. |
| Married (%) | 86.8 | 92.9 | 80.7 | < 0.01 |
| Depression (MMPI[d] score) | 22.8 ± 5.0 | 22.9 ± 6.2 | 23.9 ± 5.6 | 0.02 |
| Intensity of conditioning physical activity (MET) | 5.9 ± 1.7 | 5.8 ± 1.5 | 5.7 ± 1.8 | n.s. |
| Alcohol consumption (g/week) | 70.7 ± 110 | 87.8 ± 138 | 107.2 ± 166 | < 0.001 |
| Cigarette smoking (pack-years) | 7.4 ± 15.3 | 12.3 ± 19.1 | 11.4 ± 19.5 | < 0.001 |
| Serum high density lipoprotein cholesterol (mmol/l) | 0.87 ± 0.27 | 0.84 ± 0.25 | 0.85 ± 0.26 | n.s. |
| Blood leukocyte count ($\leftrightarrow 10^3/mm^3$) | 5.6 ± 1.5 | 5.5 ± 1.3 | 5.8 ± 1.5 | n.s. |
| Plasma fibrinogen (g/l) | 2.96 ± 0.52 | 2.97 ± 0.48 | 3.07 ± 0.54 | 0.03 |
| Serum triglycerides (mmol/l) | 1.23 ± 0.74 | 1.17 ± 0.61 | 1.34 ± 0.72 | n.s. |
| Maximal oxygen uptake (l/min) | 2.57 ± 0.57 | 2.49 ± 0.53 | 2.47 ± 0.55 | 0.01 |
| Height (cm) | 173.1 ± 6.0 | 173.1 ± 5.3 | 173.1 ± 6.0 | n.s. |
| Weight (kg) | 79.8 ± 11.7 | 80.2 ± 10.1 | 81.9 ± 13.7 | n.s. |

[a] Coronary heart disease.
[b] Ishaemic heart disease.
[c] High score denotes low socioeconomic status.
[d] Minnesota multiphase personal inventory.

lower mortality rates among religious groups. The number of deaths in our study was too small for an analysis of cause-specific mortality.

The findings suggest that increased incidence of deaths due to injuries and other external causes among the Orthodox may have contributed to the excess mortality. In a study among men in Finland[31] the suicide rate for Orthodox men was 74 per 100 000, 51 for non-affiliated, and 42 for Lutherans. The higher rate among the Orthodox was ascribed to the lack of social integration and dispersed living. Many of the subjects were forced to migrate from Karelia to the rest of Finland during World War II as refugees and settle down among the Finnish population. That could have created an additional psychological burden with adverse health effects. However, the increased mortality of the Orthodox as compared with the Lutherans remained after controlling for the migration experience. This may not capture the real impact of the war and settlement in the new homeland. If there are truly increased suicidal tendencies among the Orthodox one might assume that in some cases religion may inhibit individuals from overt self-destruction so that they may turn to more indirect ways of life-threatening behaviour.[29] This could explain, in part, our results regarding the excess mortality due to injuries and other external causes among the Orthodox.

Inadequate control for various other risk factors has characterized many previous studies[29] and it has remained unclear whether the differences in mortality among religious groups may be attributed to such risk factors as social support and control, socioeconomic status, ethnicity, diet,[29] or some other health-related practices. Our findings indicate that the disparities in mortality may not be explained entirely by such factors. There were significant differences in smoking and alcohol use among the religious groups in our data but these did not account for the variation in mortality risk among the religious groups. We also adjusted for other common lifestyle characteristics which might have explained

the differences in mortality in our study population, yet the association persisted. Even though we assessed many known risk factors for cardiovascular and cancer death, we did not find any behavioural factors that could have explained the mortality differences.

The strong association between Eastern Orthodoxy and all-cause mortality is difficult to explain. The reasons for the higher risk of the Orthodox men for all-cause mortality in this study remain largely unsolved. Our data do not enable further exploration of the genetic and cultural background, or religious behaviour at any deeper level. Religion is a complex factor and probably operates in a multivariate domain.[32] Our finding suggests that religion and religious differences may be important determinants of psychosocial characteristics and behaviours that are related to the risk of death.

*In conclusion, our study suggests that Eastern* Orthodox religion associates with higher all-cause mortality as compared with Lutheran religion and non-affiliation and adjustment for traditional risk factors does not explain the divergences. Our results promote the old idea that religion associates with the length of life but how this is mediated warrants further studies of religion and the related psychosocial and behavioural characteristics.

## ACKNOWLEDGEMENTS

The Kuopio Ischemic Heart Disease Risk Factor Study has been supported by grants from the Finnish Academy and the Ministry of Education of Finland and National Heart, Lung and Blood Institute (grant HL 44199). Dr Jorma Räsänen was supported by a grant from the Yrjö Jahnsson Foundation. The authors thank Kimmo Ronkainen, MSc, for carrying out the data analyses.

## REFERENCES

[1] Seidman H, Garfinkel L, Craig L. Death rates in New York City by socio-economic class and religious groups and by country of birth, 1949–51. *Jew J Socio* 1964; **4:** 254–73.

[2] Bojanowsky J. Religion and life expectancy: a contribution concerning the cultural influences on health. (Religion und Lebenserwartung: ein Beitrag zu den kulturellen Einflussen auf die Gesundheit) *Lebensversicherungsmedizin Karlsruhe* 1981; **33:** 141–42.

[3] Shapiro S, Weinblatt E, Frank C *et al.* Incidence of coronary heart disease in a population insured for medical care (HIP): Myocardial infarction, angina pectoris, and possible myocardial infarction. *Am J Public Health* 1969; **59 (Suppl. 2):** 1–101.

[4] Winkelstein W, Rekate A C. Age trend mortality from coronary heart disease in women and observations on the reproductive pattern of those affected. *Am Heart J* 1964; **4:** 481–88.

[5] Epstein F H, Boas E P, Simpson R. The epidemiology of arteriosclerosis among a random sample of clothing workers of different origins in New York City. *J Chron Dis* 1957; **5:** 300–28.

[6] Wardwell W I, Hyman M, Bahnson C B. Socio-environmental antecedants to coronary heart disease in 87 white males. *Soc Sci Med* 1968; **2:** 165–83.

[7] Friedman E H, Hellerstein H K. Occupational stress, law school hierarchy, and coronary artery disease in Cleveland attorneys. *Psychosom Med* 1968; **30:** 72–86.

[8] Watson J S. Religion as a cultural phenomenon, and national mortality rates from heart disease. *Psychol Rep* 1991; **69:** 439–42.

[9] Lyon J L, Sorenson A W. Colon cancer in a low risk population. *Am J Clin N Am* 1978; **31:** 5227–30.

[10] Lemon F R, Walden R T. Death from respiratory system disease among Seventh-Day Adventist men. *JAMA* 1966; **198:** 117–26.

[11] Berkel J. *Clean Life*. Amsterdam: Drukkerij Insulinde, 1979.

[12] Waaler H T, Hjort P F. Low mortality among Norwegian Seventh-Day Adventists 1960–1977. A message on lifestyle and health? *Tidsskr Nor Laegeforen* 1981; **101:** 623–27.

[13] Phillips R L, Lemon F R, Beeson L W *et al.* Coronary heart disease mortality among Seventh-day Adventists with differing dietary habits: A preliminary report. *Am J Clin N Am* 1978; **S:** 191–98.

[14] Snyder M, Goldbourt U, Medalie J *et al.* The low incidence of heart disease among religious Jews compared with non-religious. *Thora and Mada* 1978; **8:** 35–40.

[15] Goldbourt U, Yaari S, Medalie J. Factors predictive of longterm coronary heart disease mortality among 10 059 male Israeli civil servants and municipal employees. *Cardiology* 1993; **82:** 100–21.

[16] Friedlander Y, Kark J D, Stein Y. Religious orthodoxy and myocardial infarction in Jerusalem—a case control study. *Int J Cardiol* 1986; **10:** 33–41.

[17] Berkman L F, Syme S L. Social networks, host resistance, and mortality: A nine year follow-up study of Alameda County residents. *Am J Epidemiol* 1979; **109:** 186–204.

[18] Kaplan G A, Wilson T W, Cohen R D, Kauhanen J, Wu M, Salonen J T. Social functioning and overall mortality: Prospective evidence from Kuopio Ischemic Heart Disease Risk Factor Study. *Epidemiology* 1994; **5:** 495–500.

[19] Northouse L L. The impact of breast cancer on patients and husbands. *Cancer Nursing* 1989; **5:** 276–84.

[20] Levin J S, Schiller P L. Is there a religious factor in health? *J Relig Health* 1987; **1:** 9–35.

[21] Salonen J T, Nyyssönen K, Korpela H *et al.* High stored iron levels are associated with excess risk of myocardial infarction in eastern Finnish men. *Circulation* 1992; **86:** 803–11.

[22] Kaplan G A, Salonen J T. Socioeconomic conditions in childhood and ischemic heart disease during middle age. *BMJ* 1990; **301:** 1121–23.

[23] Lakka T A, Venäläinen J M, Rauramaa R *et al.* Relation of leisure-time physical activity and cardiorespiratory fitness to the risk of acute myocardial infarction in men. *N Engl J Med* 1994; **330:** 1549–54.

[24] Kauhanen J, Julkunen J, Salonen J T. Coping with inner feelings and stress: Heavy alcohol use in the context of alexithymia. *Beh Med* 1992; **18:** 121–26.

[25] Everson S A, Goldberg D E, Cohen R D, Pukkala E, Tuomilehto J, Salonen J T. Hopelessness and risk of mortality, myocardial infarction, and cancer incidence. *Psychosom Med* (In press.)

[26] Dahlstrom W G, Welsh G S, Dahlstrom L E. *MMPI-Handbook, Vol 2, rev. edn.* Minneapolis, MI: Research Applications, University of Minnesota Press 1975.

[27] Cox D R, Oakes D. *Analysis of Survival Data*. New York: Chapman and Hall, 1984.

[28] *Structure of Population*. Statistics, Finland 1991.

[29] Jarvis G K, Northcott H C. Religion and differences in morbidity and mortality. *Soc Sci Med* 1987; **25:** 813–24.

[30] Abrahamson J H, Gofin R, Peritz E. Risk markers for mortality among elderly men—A community study in Jerusalem. *J Chron Dis* 1982; **35:** 565–72.

[31] Sihvo J. The effect of Christianity on the attitudes towards suicide. In: Achte K, Lindfors O, Lonquist J *et al.* (eds.) *The Finnish Suicide*. Helsinki, 1989.

[32] Shaeffer C H, Gorsuch R L. Psychological adjustment and religiousness: The multivariate belief-motivation theory of religiousness. *J Sc Stud Relig* 1991; **30:** 448–61.

*(Revised version received February 1996)*