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David Madden

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David Madden

(School of Economics, University College Dublin)

Abstract: The General Health Questionnaire (GHQ) is frequently used as a measure of mental well-being. A consistent pattern across countries is that women report lower levels of mental well-being, as measured by the GHQ. This paper applies decomposition techniques to Irish data for 1994 and 2000 to examine the factors lying behind the gender differences in GHQ score. For both 1994 and 2000 about two thirds of the raw difference is accounted for by differences in characteristics, with employment status the single most important factor.

Keywords: Mental Well-Being, decomposition, gender difference.

JEL Codes: I12, I31, I32.

Corresponding Author: David Madden,
School of Economics,
University College Dublin,
Belfield,
Dublin 4,
Ireland.

Phone: 353-1-7168396
Fax: 353-1-2830068
E-Mail: david.madden@ucd.ie

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Gender Differences in Mental Well-Being: A Decomposition Analysis

1. Introduction

The General Health Questionnaire (GHQ) first introduced by Goldberg [1] is one of the most commonly employed measures of mental health. The original development of the measure involved a 60 item version (GHQ-60) with the "best" 30, 20 and 12 of these items being identified for use when the respondent's time was at a premium (giving rise to the GHQ-30, GHQ-20 and GHQ-12 measures respectively). Items in the GHQ consist of a question asking whether the respondent has recently experienced a particular symptom or item of behaviour rated on a four-point scale. For example a respondent might be asked the question: have you recently been feeling reasonably happy, all things considered? The respondent then answers from one of the following four categories: more so than usual, same as usual, less than usual, or much less than usual.

The GHQ score can be used as a predictor of an individual being a psychiatric case. The score is highly correlated with standardised clinical interviews and in a review of six validity studies of the GHQ-12, Goldberg and Williams [2] reported sensitivity rates (proportion of cases correctly identified) of between 71% and 91%, as well as specificity rates (proportions of normals correctly identified) of between 71% and 91%. The variance weighted mean of sensitivity and specificity rates were 89% and 80% respectively.

Two main scoring systems are then used to summarise the GHQ score. The first, the GHQ method, assigns a score of 0 if the individual answers in either of the first two categories or 1 if answering either of the latter two categories. The alternative scoring method is the Likert method where responses are given weights of 0,1,2, and 3. In this case, the "best" GHQ score in terms of mental well-being is a score of 0, while the worst is a score of 36. In some cases, the Likert ordering may be reversed, so that weights of 3, 2, 1, and 0 are given, in which case the best score is 36 and the worst is 0. This is the scoring system employed in the analysis here.

In terms of the choice between GHQ and Likert scoring systems, Banks et al [3] suggest that the Likert method is to be preferred to the GHQ method in studies using parametric multivariate techniques, since its distribution more closely approximates the normal.

There is evidence to suggest that women exhibit higher rates of minor psychiatric morbidity and depression than men (Goldberg and Williams [2]). Bebbington [4] and Bebbington et al [5] consider the possible factors lying behind the higher rates of depressive disorder for women. What they term "macrosocial" factors such as income, marital and employment status are clearly important but their effect differs across countries arguably because they reflect other underlying conditions. They note evidence that age appears to be important, with the female:male ratio of depressive disorder showing an "inverse U" relationship. The increase in the female excess around the time of puberty and the decline around the time of menopause is suggestive of a role for hormones. However, it is difficult to relate the changes in the female:male ratio to actual hormonal changes. Thus it is possible that the changes in the female:male ratio around the time of puberty and the menopause may reflect the fact that these are times of social and psychological transition, rather than any hormonal changes.

Weich et al [6] investigated whether the higher presence of common mental disorders (as measured by the GHQ-12) amongst women compared to men could be accounted for by differences in the number of social roles (e.g. paid worker, carer, living with dependent children etc) played by men and women. They found no statistically significant effect, a result which is echoed by the papers of Emslie at al [7, 8] who also investigate the effect of social role and find no effect.

Kuehner [9] reviews the literature on gender differences in unipolar depression and finds that the gender difference shows no sign of narrowing over time. She concludes that more integrative models are needed which take into account psychological, psychosocial and macrosocial factors and their interactions and which also connect with physiological and endocrine responses.

This paper adopts a multivariate approach to investigate the factors lying behind gender differences in GHQ scores in Ireland for two years, 1994 and 2000. We choose two years in order to investigate whether the gender difference and the factors lying behind it have changed over time. We borrow techniques from the labour economics literature to decompose the difference in GHQ scores into that part attributable to differences in underlying characteristics (such as age, education, employment status etc) and that attributable to the "return" to these characteristics i.e. the impact of these characteristics on GHQ score. The remainder of the paper is as follows. In the next section we briefly explain the decomposition approach we take. In section 3 we discuss our data source and present results of the decomposition while section 4 presents concluding comments.

2. The Blinder-Oaxaca Decomposition

The decomposition approach we adopt is the well-known one from labour economics associated with Blinder and Oaxaca (Blinder [10], Oaxaca, [11]). This has become a standard technique for decomposition of "gaps" in outcomes such as wages between different population groups. Typically the population is partitioned into two groups on the basis of a variable which in principle should not affect the outcome in question. Thus wage gaps between groups which are partitioned on the basis of gender, race or religion may be decomposed into a part accounted for by differences in characteristics and a part accounted for by differences in the "returns" to characteristics. Blinder-Oaxaca (henceforth B-O) type decompositions have typically been carried out using linear regression models owing to the attractive property that such models fit exactly at the mean of the sample, but the approach has also been used for binary, ordered and count models [12-14]. Although an ordered probit approach could be adopted with our data (and is outlined in the appendix) for reasons we discuss below we adopt the linear regression approach in the main text of the paper.

The standard B-O decomposition follows from an equation of the following type:

$$Y_i = X_i'\beta_i + \varepsilon_i$$

where Y_i refers to the outcome (in this case GHQ score) for individual i (who may be male or female, X_i is a vector of determinants of GHQ (e.g. age, education, marital status etc.), β_i is the associated parameter vector and ε_i is an error term following a normal distribution (0, σ_ε). The standard B-O decomposition then breaks down the difference between male and female GHQ in the following way:

$$\overline{Y}_m - \overline{Y}_f = (\overline{X}_m - \overline{X}_f)'\hat{\beta}_m + \overline{X}_f'(\hat{\beta}_m - \hat{\beta}_f)$$

where $\overline{Y}_m$ is the predicted mean GHQ for males, $\overline{X}_m'$ is the mean vector of variables for males which determine GHQ and $\hat{\beta}_m$ is the vector of estimated returns to the GHQ determinants for males (likewise for females with the "f" subscript).

The first term on the right hand side is that part of the gap (evaluated at the mean) which can be assigned to differences in characteristics, while the second term is that part of the gap assigned to differences in the returns to characteristics. In turn the contribution of each of the variables in the *X* vector to the overall difference in characteristics can be calculated (and likewise with respect to the returns to characteristics). The difference in GHQ scores arising from the difference in characteristics is sometimes known as the “explained” part while the difference arising from differences in the returns to characteristics may be labelled the “unexplained” part. When these decompositions are carried out for wage gaps the unexplained part is sometimes regarded as that portion of the gap arising from discrimination (for a discussion of the differing meaning which economists and lawyers attach to the concept of discrimination, see Ashenfelter and Oaxaca [15]).

Decompositions of the above type will be sensitive to whichever group’s GHQ is assumed to be the norm (in the example above it is assumed that the male score is the norm). This is a standard path-dependence (or index number) issue and typically in labour market applications the reference group is taken to be that with the higher wage. In our application here there does not seem to be a compelling case to regard either males or females as the reference or norm and so we adopt the procedure of Neumark [16] who suggests using the vector of returns obtained from the pooled sample of males and females (see Oaxaca and Ransom [17] for a more detailed discussion of this issue). In this case the decomposition is

$$\overline{Y}_m - \overline{Y}_f = (\overline{X}_m - \overline{X}_f)'\hat{\beta}^* + \overline{X}'_f(\hat{\beta}^* - \hat{\beta}_f) + \overline{X}'_m(\hat{\beta}_m - \hat{\beta}^*)$$

where $\hat{\beta}^*$ is the vector of returns obtained from the pooled sample. Once again the first term on the right-hand side of the equation is the explained portion, while the next two terms account for the unexplained portion.

The analysis above assumes that the dependent variable is cardinal, as would be the case for, say, wages. In this paper the dependent variable, the GHQ, is an ordered categorical variable, albeit with quite a high number of categories (from 0 to 36). Strictly speaking, the appropriate modelling technique in these circumstances is an ordered probit or ordered logit (for an account of these models, see Wooldridge [18]). While Blinder-Oaxaca type decompositions can be carried out with ordered response models, it is not possible to estimate the contribution of each individual variable to the explained and unexplained parts of the decomposition. This is because while the sign of the estimated coefficient in an ordered model will give the direction of the effect of an independent variable on the probability of Y taking on the lowest and highest categories (GHQ values of 0 and 36), the sign does not always determine the direction of the effect for intermediate outcomes. Thus for the main text of this paper we estimate and carry out the decomposition assuming that the GHQ is a cardinal variable and employ the linear specification above. In the appendix we estimate ordered probit models and carry out the basic decomposition for these models. The outcomes are qualitatively very similar to the results with the linear model, so we are confident that the cardinality/linearity assumption is exercising very little influence on the results of the paper.

3. Data and Results

In this section we apply the approach outlined above to Irish data. The data comes from two waves of the Living in Ireland Survey (LII), 1994 and 2000. The LII survey is a nationally representative survey which forms the Irish part of the European Community Household Panel Survey. It has been used extensively in a variety of studies on (amongst other issues) poverty, deprivation and education. The LII survey is available on an annual basis for each year from 1994 to 2001. As 1994 was the initial year of the survey and in 2000 a booster sample was added to combat attrition, we believe that the samples in these particular years are most representative of the national population (for a more detailed discussion of the LII survey, see Nolan et al [19] and Watson [20]).

The dependent variable is GHQ-12 which takes on values from 0 to 36, with a value of zero representing the greatest level of mental stress and a value of 36 representing the least. The difference in GHQ-12 values by gender are confirmed by table 1 which gives average values for males and females for 1994 and 2000 and shows that the excess of GHQ for males was of the order of 3.4% in 1994 and 2.8% in 2000. It is also worth noting that average values for both male and female increased over the period, indicating lower levels of mental stress in 2000 compared to 1994 (see Madden [21]). Table 2 gives the population characteristics by gender. That the difference in GHQ by gender is statistically significant is confirmed by the preliminary regression in table 3, which regresses GHQ-12 against a variety of variables using the pooled male and female sample. We observe that, controlling for other variables, being female tends to reduce the GHQ score by about one unit. The age-sex interaction term is positive and significant, indicating that the gap between male and female shrinks as people get older. The variables with the greatest impact upon GHQ are marital status, health and principal economic status (at work, unemployed etc). The decomposition analysis will permit us to investigate whether the impact of these variables differ by gender.

We should bear in mind that the results presented in table 3 do not constitute a structural model of the determination of GHQ. Instead we estimate a reduced form equation for GHQ which attempts to identify those factors affecting GHQ without specifying the pathway whereby this effect comes about. Thus the estimating equations (and consequent decompositions which we carry out) are very much in the spirit of Clark and Oswald [21, 22]. We model GHQ as depending upon the following variables: age, income, marital status, education, health, principal economic status (which mainly reflects labour force status), and two social capital variables, membership of a club or society and religious attendance. For some covariates the direction of causality should be interpreted with caution. Thus not being a member of a club or society may act to lower GHQ score, but it is arguably just as likely that causality is in the other direction i.e. suffering from mental stress and having a low GHQ decreases the probability that one would join a club.

Note that many of the variables which enter the reduced form model for mental stress are categorical variables, such as education or marital status. Oaxaca and Ransom [23] point out an identification problem which can arise with decompositions when one or more of the right-hand variables is categorical. The separate contributions of sets of dummy variables to the unexplained portion of the decomposition are not invariant to the choice of reference group for categorical variables (i.e. the omitted category). A solution to this issue is provided by Gardeazabal and Ugidos [24] who point out that identification can be obtained via a normalisation restriction on the coefficients of each set of dummy variables. The restriction is that for a categorical variable X_j with G groups, the sum of the coefficients on the G groups must be zero i.e. $\sum_{g=1}^{G} \hat{\beta}_{gj} = 0$. Thus essentially, in the case of the categorical variable, rather than estimating the coefficient $\hat{\beta}_{gj}$ i.e. the coefficient for X_{gj} the gth group of categorical variable j, we estimate the coefficient on (X_{gj}-X_{1j}) where group 1 is the reference category.

Before carrying out the decomposition by gender, we first present the characteristics of the population (in terms of the variables in table 2) by gender and year. In terms of differences in characteristics by gender, we note that females tend to be in families with slightly lower income and also have higher rates of widowhood, reflecting lower life expectancy for males. The educational profile is different, with more women listing the Leaving Cert as their highest level of education while a slightly higher fraction of males have third level education. The greatest difference in characteristics is to be observed in terms of principal economic status. A significantly higher fraction of males are in the labour force (either unemployed or working, the default category) while there is a correspondingly higher fraction of females on home duties. Males are more likely to be a member of a club or association, while women are more likely to attend religious services. In terms of changes over time, the sample in 2000 was older (despite the addition of the booster sample) but probably the biggest change in terms of characteristics is the reduction in the fraction of men unemployed and in the fraction of women on home duties. There is also a lower fraction of both genders reporting health problems and also lower religious attendance.

Table 4 presents regression results for the pooled sample and for males and females for 1994 and 2000.[1] In terms of differences in the coefficients, we note that the magnitude of the effect of marital status differs by gender – being single/married has a greater positive effect for females and it is also greater in 1994 compared to 2000. The same can be said of the *negative* effect of separation/divorce. The positive effect of education on GHQ appears to be greater for females in 1994, though for 2000 the gender difference is not so pronounced. The negative effect of health appears to be greater for females in 1994 while in 1994, being unemployed has a negative effect for both males and females, but by 2000 the negative effect for males has diminished, while it has disappeared for females. Similarly the positive effect of being retired is stronger for males and is also stronger in 1994. The effect of being on home duties is strongly negative for males in 1994 and approaching conventional significance levels (perhaps reflecting disguised unemployment) but by 2000 this effect has disappeared. The slightly stronger positive effect of club membership on GHQ for males (in 1994 at least) compared to females and the slightly stronger effect of religion for females compared to males mirrors the differences in characteristics and suggests that both club membership/religion and GHQ are being simultaneously determined and reinforces the earlier comments regarding direction of causation.

We now turn to the decompositions. As shown in table 5, for 1994, the gap in average GHQ by gender was approximately 0.85. The explained gap taking account of characteristics alone is 0.56 or about 66% of the actual gap. Thus if females had the same characteristics as males, then their average GHQ gap with regard to males would be only about two thirds of what it actually is. Correspondingly the unexplained gap in 1994 is about 0.29. The breakdown is remarkably consistent over the two periods with differences in characteristics accounting for about 65% of the smaller absolute gap in 2000. The breakdown is also relatively insensitive to whether a linear regression or ordered probit approach is adopted, with characteristics explaining about 60% of the difference in both years when using an ordered probit.

As explained above, the principal advantage of the linear regression approach is that it is possible to identify the contributions of individual variables to the explained and unexplained portions of the raw gap and these contributions are presented in table 6. Dealing with the explained differences first, the relative contributions of different factors changes little over the period. The biggest single contribution to the explained

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[1] We confine our discussion to comparing the coefficients for males and females bearing in mind that

gap comes from being at work. While not clear from the regressions (where working is the omitted category) being at work has a positive effect on GHQ and there is a considerably higher proportion of males at work. This is also true of the retirement category but it is interesting to note that the corresponding negative effect of unemployment, which worked strongly in favour of females in 1994, has largely disappeared by 2000. Club membership also works in favour of males (bearing in mind the caveat regarding the direction of causation) as does being single, though both these effects are weaker in 2000 than in 1994.

The unexplained differences are more difficult to interpret and are more volatile over the two years, but one point is worth making. In 1994 the difference in the intercepts of the regressions for men and women i.e. that portion of the unexplained difference which cannot be attributed to any variable, was about –0.18 i.e. the intercept for females was slightly higher than that for males. By 2000 that had swung around to a value of about +3.0 in favour of males, a change which dwarfs any of the other changes in the contributions of variables to the unexplained difference. This indicates that while the overall importance of unexplained factors in terms of accounting for the raw gap has remained virtually unchanged at about 34%, within that unexplained portion the role of unobservable factors has grown significantly.

4. **Conclusions**

This paper has addressed the issue of the higher level of mental stress (as measured by GHQ score) of women compared to men using the well-known Blinder-Oaxaca decomposition method. The analysis is applied to Irish data for two different years, 1994 and 2000. The raw gap in GHQ declines slightly over the period but the

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the coefficient for the pooled sample will lie in between.

breakdown of that gap into its explained and unexplained portions remains remarkably stable. In terms of the contribution of individual characteristics to the explained portion, the role of principal economic status, in particular the positive effect of employment, is notable. Marital status and membership of a club are other factors which account for a significant proportion of the explained portion of the gap. In terms of the unexplained portion of the gap, the role of the intercept term (which could be regarded as the unobserved portion of the unexplained gap) has grown in importance between 1994 and 2000, having increased substantially for males and only marginally for females.

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Appendix: Decomposition Using Ordered Probit

An individual's GHQ score is an ordered categorical variable. Thus it may be appropriate to model GHQ using an ordered probit/logit approach. When using such an approach the straightforward Blinder-Oaxaca decomposition outlined in the main text is no longer applicable, as the conditional expectation $E(Y|X)$ is no longer equal to $\overline{X}\hat{\beta}$. Thus an alternative way of carrying out the decomposition must be found. In what follows we adapt the procedure outlined in Bauer and Sinning [25]. For the general case of a non-linear decomposition we have the decomposition for the outcome for individual i, Y_i given by

$$\Delta_m^{NL} = [E_{\beta_m}(Y_{im}|X_{im}) - E_{\beta_m}(Y_{if}|X_{if})] + [E_{\beta_m}(Y_{if}|X_{if}) - E_{\beta_f}(Y_{if}|X_{if})]$$

where $E_{\beta_m}(Y_{im}|X_{im})$ is the conditional expectation of male outcomes and $E_{\beta_m}(Y_{if}|X_{if})$ is the conditional expectation of female outcomes evaluated with the male parameter vector, β_m. Alternatively, using females as the reference group the decomposition is

$$\Delta_f^{NL} = [E_{\beta_f}(Y_{im}|X_{im}) - E_{\beta_f}(Y_{if}|X_{if})] + [E_{\beta_m}(Y_{im}|X_{im}) - E_{\beta_f}(Y_{im}|X_{im})].$$

In both cases the first term on the right hand side provides that portion of the difference in conditional expectation arising from differences in characteristics, X_m, X_f and the second term refers to the difference arising from the "returns" to those characteristics, β_m, β_f. Thus to apply this decomposition it is necessary to obtain the sample counterparts $S(\hat{\beta}_m X_{im})$ and $S(\hat{\beta}_f X_{im})$ of the conditional expectations, $E_{\beta_g}(Y_{ig}|X_{ig})$ and $E_{\beta_h}(Y_{ig}|X_{ig})$ where $(g,h) = (m, f)$ and $m \neq f$. We now apply this decomposition to the case of an ordered model.

An ordered model is based upon a latent regression of the form $Y^*_{im} = X_{im}\beta_m + \varepsilon_{im}$ where Y^*_{im} is unobserved (we give the example here in terms of male outcomes). Instead we observe

$Y_{im} = 0$ if $Y^*_{im} \leq 0$

= 1 if $0 \leq Y^*_{im} \leq \mu_1$

= 2 if $\mu_1 \leq Y^*_{im} \leq \mu_2$

…

= J if $\mu_{J-1} \leq Y^*_{im}$.

where the μ_i , the "cut-off points", are parameters to be estimated along with the vector β_m. The conditional expectation of Y_{im} evaluated at the parameter vector β_m is:

$$E_{\beta_m}(Y_{im} | X_{im}) = F(\mu_1 - X_{im}\beta_m) - F(-X_{im}\beta_m)$$

$$+ 2[F(\mu_2 - X_{im}\beta_m) - F(\mu_1 - X_{im}\beta_m)]$$

$$+ \ldots$$

$$+ J[1 - F(\mu_{J-1} - X_{im}\beta_m)].$$

If we assume that the error term, ε_{im}, is distributed normally we obtain the ordered probit model and *F* refers to the cumulative standard normal distribution (if we assume it is distributed logistically we obtain the ordered logit model and *F* refers to the cumulative logistic distribution).

Given estimation of the parameter vector β_{im}, the sample counterparts of the components of the decomposition (assuming males to be the reference group) are calculated as follows:

$$S(\hat{\beta}_m X_{im}) = N^{-1}\sum_{i=1}^{N}\{[F(\hat{\mu}_1 - X_{im}\hat{\beta}_m) - F(-X_{im}\hat{\beta}_m)]$$

$$+ 2[F(\hat{\mu}_2 - X_{im}\hat{\beta}_m) - F(\hat{\mu}_1 - X_{im}\hat{\beta}_m)]$$

$$+ \ldots$$

$$+ J[1 - F(\hat{\mu}_{J-1} - X_{im}\hat{\beta}_{im})]\}.$$

The sample counterpart of $E_{\beta_m}(Y_{if} \mid X_{if})$, $S(\hat{\beta}_m X_{if})$ is obtained by replacing X_{im} by X_{if} in the above equation. The sample counterparts are then used to obtain the parts of the decomposition:

$$\hat{\Delta} = [S(\hat{\beta}_m X_{im}) - S(\hat{\beta}_m X_{if})] + [S(\hat{\beta}_m X_{if}) - S(\hat{\beta}_f X_{if})].$$

The case where females are the reference group is the mirror image of above, while the decomposition for the Neumark approach of using the estimates of the pooled sample as the reference group gives:

$$\hat{\Delta} = [S(\hat{\beta}_m X_{im}) - S(\hat{\beta}^* X_{im})] + [S(\hat{\beta}^* X_{if}) - S(\hat{\beta}_f X_{if})] + [S(\hat{\beta}^* X_{im} - S(\hat{\beta}^* X_{if})].$$

Table A1 provides the counterpart to table 3 and gives the results for the ordered probit models for the pooled sample of men and women for 1994 and 2000. As in the case of the linear regression, the gender coefficients are statistically significant. While the interpretation of coefficients for the ordered probit is obviously different from the linear regression case it is noticeable that the pattern of coefficients by sign and significance levels by variable is very similar.

Table A2 provides the counterpart to table 4 with the regressions by gender and the pooled regressions (not including the gender variable). Once again the pattern by sign and significance level is very similar, and while not every coefficient takes the same sign as its counterpart in the linear regressions in table 4, the vast majority do, and in those cases where the sign is different, the coefficient is typically not statistically significant. This gives confidence to our belief that the qualitative results obtained are not sensitive to the choice of OLS or ordered probit.

Table 1: GHQ by Gender, 1994 and 2000

	Male	Female	Difference	% Difference
1994 (n=8731)	26.036	25.187	0.849	3.4
2000 (n=6612)	26.541	25.809	0.732	2.8

Table 2: Population Characteristics By Age and Gender

Variable	1994		2000	
	Male (N=4174)	Female (N=4547)	Male (N=3057)	Female (N=3551)
Age	42.916	43.115	45.337	45.677
Income (log)	5.738	5.707	6.149	6.090
Single	0.377	0.290	0.372	0.276
Married	0.585	0.596	0.582	0.587
Sep/Divorced	0.011	0.026	0.019	0.036
Widowed	0.028	0.088	0.028	0.101
No Quals	0.37	0.343	0.320	0.290
Inter Cert	0.246	0.212	0.240	0.220
Leaving Cert	0.247	0.325	0.264	0.323
3rd Level	0.137	0.12	0.176	0.167
Bad Health	0.034	0.032	0.034	0.025
Mild Health	0.129	0.138	0.106	0.116
Working	0.639	0.325	0.674	0.419
In Education	0.076	0.072	0.064	0.07
Unemployed	0.111	0.038	0.043	0.022
Retired	0.147	0.034	0.182	0.049
Home Duties	0.002	0.519	0.005	0.422
Other	0.025	0.011	0.031	0.016
Club Member	0.519	0.341	0.51	0.369
Religious	0.783	0.849	0.727	0.779

Table 3: OLS Regression of GHQ, 1994 and 2000

Variable	1994 (n=8721)	2000 (n=6608)
Age	-0.093	-0.046
	*(0.021)****	*(0.021)***
Age^2	0.001	0.000
	*(0.000)****	*(0.000)*
Sex	-1.046	-0.946
	*(0.274)****	*(0.283)****
Age*Sex	0.015	0.014
	*(0.006)***	*(0.006)***
Income (log)	0.370	0.227
	*(0.089)****	*(0.085)****
Married	0.703	0.386
	*(0.125)****	*(0.115)****
Separated/Divorced	-1.405	-0.497
	*(0.282)****	*(0.236)***
Widowed	-0.657	-0.490
	*(0.201)****	*(0.190)****
Inter Cert	0.054	-0.056
	(0.092)	*(0.091)*
Leaving Cert	0.229	0.256
	*(0.089)****	*(0.087)****
3rd Level	0.028	0.037
	(0.117)	*(0.105)*
Bad Health Problem	-6.357	-6.369
	*(0.297)****	*(0.315)****
Mild Health Problem	-2.865	-2.401
	*(0.154)****	*(0.170)****
In Education	0.561	-0.102
	*(0.203)****	*(0.213)*
Unemployed	-1.542	-0.413
	*(0.181)****	*(0.249)**
Retired	0.990	0.965
	*(0.209)****	*(0.196)****
Home Duties	0.239	0.019
	(0.156)	*(0.153)*
Other	-1.232	-1.245
	*(0.334)****	*(0.300)****
Club Membership	0.683	0.598
	*(0.107)****	*(0.106)****
Religious	0.792	0.444
	*(0.132)****	*(0.123)****
Constant	23.951	25.356
	*(0.705)****	*(0.732)****

Standard Errors in brackets. Default category is male, single, with no formal educational qualifications, no health problem and working. *, ** and *** indicate significant at 1%, 5% and 10% respectively.

Table 4: OLS Regression of GHQ by Gender, 1994 and 2000

Variable	1994			2000		
	Pooled	M	Fe	Pooled	M	Fe
Age	-0.084	-0.058	-0.117	-0.040	-0.067	-0.015
	*(0.021)****	*(0.029)***	*(0.031)****	*(0.021)**	*(0.028)***	*(0.031)*
Age^2	0.001	0.001	0.001	0.000	0.001	0.000
	*(0.000)****	*(0.000)**	*(0.000)****	*(0.000)*	*(0.000)**	*(0.000)*
Income (log)	0.356	0.342	0.409	0.224	0.161	0.271
	*(0.089)****	*(0.123)****	*(0.128)****	*(0.085)****	*(0.118)*	*(0.123)***
Married	0.712	0.205	0.921	0.387	0.195	0.432
	*(0.123)****	*(0.213)*	*(0.164)****	*(0.113)****	*(0.185)*	*(0.155)****
Sep/Divorced	-1.475	-0.379	-1.671	-0.556	-0.058	-0.724
	*(0.282)****	*(0.509)*	*(0.350)****	*(0.236)***	*(0.392)*	*(0.306)***
Widowed	-0.625	-0.901	-0.548	-0.463	-0.459	-0.420
	*(0.199)****	*(0.365)***	*(0.252)***	*(0.186)***	*(0.345)*	*(0.242)**
Inter Cert	0.095	0.040	0.060	-0.028	0.029	-0.152
	(0.092)	*(0.124)*	*(0.137)*	*(0.091)*	*(0.122)*	*(0.135)*
Leaving Cert	0.193	0.167	0.250	0.235	0.348	0.178
	*(0.088)***	*(0.128)*	*(0.124)***	*(0.087)****	*(0.123)****	*(0.122)*
3rd Level	-0.008	-0.162	0.272	0.003	-0.205	0.280
	(0.116)	*(0.154)*	*(0.177)*	*(0.105)*	*(0.139)*	*(0.158)**
Bad Health	-6.356	-5.729	-6.810	-6.337	-6.313	-6.415
	*(0.297)****	*(0.415)****	*(0.424)****	*(0.316)****	*(0.400)****	*(0.489)****
Mild Health	-2.860	-2.634	-3.018	-2.398	-2.301	-2.458
	*(0.154)****	*(0.218)****	*(0.218)****	*(0.170)****	*(0.240)****	*(0.239)****
In Education	0.610	1.357	0.108	-0.108	0.112	-0.374
	*(0.203)****	*(0.363)****	*(0.310)*	*(0.213)*	*(0.324)*	*(0.316)*
Unemployed	-1.424	-1.294	-1.248	-0.347	-0.883	0.062
	*(0.179)****	*(0.319)****	*(0.348)****	*(0.248)*	*(0.328)****	*(0.428)*
Retired	0.909	1.548	0.924	0.905	0.800	0.842
	*(0.197)****	*(0.351)****	*(0.390)***	*(0.187)****	*(0.286)****	*(0.345)***
Home Duties	0.072	-1.850	0.079	-0.062	0.677	-0.066
	(0.125)	*(1.216)*	*(0.205)*	*(0.132)*	*(0.779)*	*(0.194)*
Other	-1.220	-1.386	-0.467	-1.220	-1.500	-1.101
	*(0.335)****	*(0.461)****	*(0.599)*	*(0.300)****	*(0.391)****	*(0.503)***
Club Member	0.766	0.831	0.535	0.662	0.527	0.647
	*(0.106)****	*(0.145)****	*(0.157)****	*(0.105)****	*(0.143)****	*(0.155)****
Religious	0.743	0.554	1.065	0.422	0.115	0.763
	*(0.132)****	*(0.170)****	*(0.205)****	*(0.122)****	*(0.160)*	*(0.185)****
Constant	23.374	23.292	23.468	24.832	26.620	23.613
	*(0.691)****	*(1.027)****	*(0.974)****	*(0.718)****	*(1.021)****	*(1.024)****
N	8721	4174	4547	6608	3057	3551
R^2 (adj)	0.176	0.191	0.160	0.164	0.191	0.140

Standard errors in brackets. Default category is single, with no formal educational qualifications, no health problem and working. *, ** and *** indicate significant at 1%, 5% and 10% respectively.

Table 5: Explained and Unexplained Gap by Gender, 1994-2000

	1994		2000	
Raw Gap (Male GHQ-Female GHQ)	0.849		0.732	
	Explained	**Unexplained**	**Explained**	**Unexplained**
Linear Regression	0.56 (66%)	0.29 (34%)	0.48 (65%)	0.26 (35%)
Ordered Probit	0.53 (60%)	0.34 (40%)	0.43 (59%)	0.30 (41%)

Table 6: Proportional Contribution of Variables to Gap by Gender, 1994-2000

Variable	1994		2000	
	Explained Difference	**Unexplained Difference**	**Explained Difference**	**Unexplained Difference**
Age	0.011	0.799	0.010	-1.364
Income	0.011	-0.387	0.013	-0.671
Single	0.121	-0.092	0.06	-0.137
Married	-0.008	-0.421	-0.002	-0.138
Sep/Divorced	0.023	0.017	0.01	0.016
Widowed	0.038	-0.014	0.034	-0.004
No Quals	-0.008	0.19	-0.006	0.04
Inter Cert	0.003	-0.006	-0.001	0.041
Leaving Cert	-0.015	-0.025	-0.014	0.048
3rd Level	0	-0.055	0	-0.083
Bad Health	-0.008	0.036	-0.06	0.003
Mild Health	0.026	0.051	0.023	0.017
Working	0.33	0.511	0.212	0.055
In Education	0.003	0.093	0.001	0.033
Unemployed	-0.103	0.008	-0.007	-0.032
Retired	0.103	0.094	0.12	-0.016
Home Duties	-0.037	-0.007	0.026	0.006
Other	-0.017	-0.012	-0.018	-0.011
Club Member	0.137	0.112	0.094	-0.063
Religious	-0.049	-0.422	-0.022	-0.488
Other Unexplained	0	-0.176	0	3.007
TOTAL	**0.561**	**0.292**	**0.473**	**0.258**

Table A1: Ordered Probit Regression of GHQ, 1994 and 2000

Variable	1994 (n=8721)	2000 (n=6608)
Age	-0.024	-0.019
	*(0.005)****	*(0.005)****
Age^2	0.000	0.000
	*(0.000)****	*(0.000)****
Sex	-0.253	-0.217
	*(0.060)****	*(0.071)****
Age*Sex	0.004	0.003
	*(0.001)****	*(0.002)***
Income (log)	0.078	0.065
	*(0.019)****	*(0.021)****
Married	0.121	0.052
	*(0.027)****	*(0.029)**
Separated/Divorced	-0.237	-0.070
	*(0.062)****	*(0.059)*
Widowed	-0.157	-0.112
	*(0.044)****	*(0.047)***
Inter Cert	0.011	-0.017
	(0.020)	*(0.023)*
Leaving Cert	0.050	0.061
	*(0.019)****	*(0.022)****
3rd Level	0.005	0.012
	(0.026)	*(0.026)*
Bad Health Problem	-1.128	-1.262
	*(0.066)****	*(0.080)****
Mild Health Problem	-0.579	-0.543
	*(0.034)****	*(0.043)****
In Education	0.097	-0.080
	*(0.045)***	*(0.053)*
Unemployed	-0.344	-0.142
	*(0.040)****	*(0.062)***
Retired	0.229	0.228
	*(0.046)****	*(0.049)****
Home Duties	0.043	0.024
	(0.034)	*(0.038)*
Other	-0.221	-0.238
	*(0.073)****	*(0.075)****
Club Membership	0.167	0.151
	*(0.023)****	*(0.026)****
Religious	0.170	0.084
	*(0.029)****	*(0.031)****

Standard errors in brackets. Default category is male, single, with no formal educational qualifications, no health problem and working. *, ** and *** indicate significant at 1%, 5% and 10% respectively.

Table A2: Ordered Probit Regression of GHQ by Gender, 1994 and 2000

Variable	1994			2000		
	Pooled	**Male**	**Female**	**Pooled**	**Male**	**Female**
Age	-0.022	-0.016	-0.027	-0.017	-0.025	-0.010
	*(0.005)****	*(0.007)***	*(0.007)****	*(0.005)****	*(0.008)****	*(0.007)*
Age^2	0.000	0.000	0.000	0.000	0.000	0.000
	*(0.000)****	*(0.000)***	*(0.000)****	*(0.000)****	*(0.000)****	*(0.000)*
Income (log)	0.075	0.085	0.075	0.064	0.059	0.065
	*(0.019)****	*(0.029)****	*(0.027)****	*(0.021)****	*(0.032)**	*(0.029)***
Married	0.121	0.030	0.163	0.052	0.001	0.066
	*(0.027)****	*(0.049)*	*(0.034)****	*(0.028)**	*(0.050)*	*(0.036)**
Sep/Divorced	-0.253	-0.068	-0.277	-0.084	0.022	-0.119
	*(0.062)****	*(0.118)*	*(0.073)****	*(0.059)*	*(0.106)*	*(0.072)**
Widowed	-0.148	-0.203	-0.136	-0.105	-0.091	-0.095
	*(0.044)****	*(0.084)***	*(0.053)****	*(0.046)***	*(0.093)*	*(0.057)**
Inter Cert	0.020	0.007	0.012	-0.011	-0.005	-0.032
	(0.020)	*(0.029)*	*(0.029)*	*(0.023)*	*(0.033)*	*(0.032)*
Leaving Cert	0.042	0.051	0.044	0.056	0.093	0.035
	*(0.019)***	*(0.030)**	*(0.026)**	*(0.022)****	*(0.033)****	*(0.029)*
3rd Level	-0.002	-0.047	0.065	0.004	-0.049	0.065
	(0.025)	*(0.036)*	*(0.037)**	*(0.026)*	*(0.038)*	*(0.037)**
Bad Health	-1.126	-1.076	-1.166	-1.253	-1.353	-1.197
	*(0.066)****	*(0.097)****	*(0.090)****	*(0.080)****	*(0.111)****	*(0.116)****
Mild Health	-0.577	-0.563	-0.589	-0.542	-0.574	-0.518
	*(0.034)****	*(0.051)****	*(0.046)****	*(0.043)****	*(0.066)****	*(0.056)****
In Education	0.108	0.234	0.039	-0.081	-0.044	-0.116
	*(0.044)***	*(0.084)****	*(0.065)*	*(0.053)*	*(0.088)*	*(0.074)*
Unemployed	-0.316	-0.302	-0.269	-0.127	-0.265	-0.008
	*(0.039)****	*(0.074)****	*(0.073)****	*(0.062)***	*(0.089)****	*(0.100)*
Retired	0.206	0.385	0.155	0.214	0.203	0.172
	*(0.043)****	*(0.081)****	*(0.082)**	*(0.047)****	*(0.078)****	*(0.081)***
Home Duties	0.009	-0.405	0.011	0.005	0.169	0.006
	(0.027)	*(0.281)*	*(0.043)*	*(0.033)*	*(0.212)*	*(0.045)*
Other	-0.218	-0.233	-0.071	-0.232	-0.273	-0.241
	*(0.073)****	*(0.107)***	*(0.126)*	*(0.075)****	*(0.106)***	*(0.118)***
Club Member	0.186	0.210	0.126	0.166	0.144	0.157
	*(0.023)****	*(0.034)****	*(0.033)****	*(0.026)****	*(0.039)****	*(0.036)****
Religious	0.158	0.121	0.225	0.079	0.018	0.144
	*(0.029)****	*(0.039)****	*(0.043)****	*(0.031)****	*(0.043)*	*(0.043)****

Standard errors in brackets. Default category is single, with no formal educational qualifications, no health problem and working. *, ** and *** indicate significant at 1%, 5% and 10% respectively.