

Centre for Well-being in Public Policy (CWIPP) seminar series
University of Sheffield, 4 July 2008

***Happy places or happy people? A multi-level
modelling approach to the analysis of happiness
and well-being***

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RES-163-27-1013



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Outline

- Measuring happiness and well-being
- Individual-level and contextual factors that may be affecting subjective happiness
- Geography of happiness in Britain
- Happy People or Happy Places? – a multilevel problem
- Concluding comments

What is happiness?

- Buddhist philosophies
- Greece, circa 500 BC
- Socrates, Plato →

Aristotle (384-322 BC)

Nicomachean Ethics (350 BC)

<http://classics.mit.edu/Aristotle/nicomachaen.html>

England, 18th century

Jeremy Bentham (1748 – 1832), the principle of Utility

John Stuart Mill (1806 – 1873) – Utilitarianism

<http://www.utilitarianism.com/>

Can happiness be measured and modelled?

A person who has had a life of misfortune, with very little opportunities, and rather little hope, may be more easily reconciled to deprivations than others reared in more fortunate and affluent circumstances. **The metric of happiness may, therefore, distort the extent of deprivation in a specific and biased way.**

(Sen, 1987: 45, my emphasis)

Andrew Oswald and colleagues: statistical regression models of happiness measuring the impact of different factors and life events upon human well being

World Database of Happiness (Ruut Veenhoven)

General Health Questionnaire (1)

Have you recently:

- Been able to concentrate on whatever you are doing?
- Lost much sleep over worry?
- Felt that you are playing a useful part in things?
- Felt capable of making decisions about things?
- Felt constantly under strain?
- Felt you could not overcome your difficulties?

General Health Questionnaire (2)

Have you recently:

- Been able to enjoy your normal day-to-day activities?
- Been able to face up to your problems?
- Been feeling unhappy or depressed?
- Been losing confidence in yourself?
- Been thinking of yourself as a worthless person?
- Been feeling reasonably happy all things considered?

Subjective happiness measure: HLGHQ1

This measure converts valid answers to questions wGHQA to wGHQL to a single scale by recoding so that the scale for individual variables runs from 0 to 3 instead of 1 to 4, and then summing, giving a scale running from 0 (the least distressed) to 36 (the most distressed). See Cox, B.D *et al*, *The Health and Lifestyle Survey*. (London: Health Promotion Research Trust, 1987).

Happiness in different activities (after Layard, 2005)

	Happiness (index)	Average hours per day
Sex	4.7	0.2
Socialising after work	4.1	1.1
Dinner	4.0	0.8
Relaxing	3.9	2.2
Lunch	3.9	0.6
Exercising	3.8	0.2
Praying	3.8	0.5
Socialising at work	3.8	1.1
Watching TV	3.6	2.2
Phone at home	3.5	0.9
Napping	3.3	0.9
Cooking	3.2	1.1
Shopping	3.2	0.4
Computer at home	3.1	0.5
Housework	3.0	1.1
Childcare	3.0	1.1
Evening commute	2.8	0.6
Working	2.7	6.9
Morning commute	2.0	0.4

Note: Based on Day Reconstruction Study. Average happiness is net affect.

Happiness in different activities (after Layard, 2005)

Interacting with:	Average happiness
Friends	3.3
Parents/relatives	3
Spouse	2.8
My children	2.7
Co-workers	2.6
Clients/customers etc	2.4
Alone	2.2
Boss	2

Factors and variables linked to subjective happiness (individual level studies)

- Age
- Education
- Social Class
- Income
- Marital status/relationships
- Employment
- Leisure
- Religion
- Health
- Life events and activities

Happiness and social comparisons

“A house may be large or small; as long as the surrounding houses are equally small it satisfies all social demands for a dwelling. But if a palace arises beside the little house, the little house shrinks to a hovel... [and]... the dweller will feel more and more uncomfortable, dissatisfied and cramped within its four walls.”

(Marx, 1847)

Geographies of happiness in Britain

Region / Metropolitan Area * GHQ: general happiness Crosstabulation

% within Region / Metropolitan Area

		GHQ: general happiness						Total
		Missing or wild	Proxy respondent	More than usual	Same as usual	Less so	Much less	
Region / Metropolitan Area	Inner London	4.5%	4.3%	14.4%	66.7%	7.7%	2.4%	100.0%
	Outer London	2.8%	5.7%	10.6%	68.6%	10.2%	2.1%	100.0%
	R. of South East	2.2%	5.0%	11.9%	70.2%	9.1%	1.6%	100.0%
	South West	1.7%	3.5%	11.3%	74.1%	8.0%	1.4%	100.0%
	East Anglia	2.1%	1.3%	10.0%	77.4%	8.5%	.8%	100.0%
	East Midlands	2.2%	1.4%	10.9%	76.0%	8.3%	1.3%	100.0%
	West Midlands							
	Conurbation	6.6%	4.6%	11.5%	66.0%	9.9%	1.3%	100.0%
	R. of West Midlands	.8%	2.2%	10.7%	73.7%	10.7%	2.0%	100.0%
	Greater Manchester	1.0%	2.6%	11.1%	75.2%	7.7%	2.4%	100.0%
	Merseyside	.4%	4.7%	9.9%	75.5%	8.6%	.9%	100.0%
	R. of North West	1.3%	4.0%	14.5%	70.7%	8.1%	1.3%	100.0%
	South Yorkshire	1.0%	1.7%	11.3%	71.0%	13.3%	1.7%	100.0%
	West Yorkshire	2.7%	2.7%	10.7%	73.9%	8.5%	1.4%	100.0%
	R. of Yorks & Humberside	1.2%	5.5%	10.1%	76.5%	5.5%	1.2%	100.0%
	Tyne & Wear	.4%	3.8%	14.0%	72.7%	6.8%	2.3%	100.0%
	R. of North	1.8%	2.3%	10.8%	72.3%	11.5%	1.5%	100.0%
Wales	3.9%	1.5%	8.8%	70.9%	12.6%	2.3%	100.0%	
Scotland	1.8%	2.3%	10.8%	74.0%	9.9%	1.3%	100.0%	
Total	2.2%	3.4%	11.3%	72.2%	9.2%	1.6%	100.0%	

Source: The British Household Panel Survey, 1991

Research questions :

- What are the factors that influence different types of individuals' happiness?
- Is the source of happiness or unhappiness purely personal or do contextual factors matter? (and if they do, to what extent?)
- *If social comparisons are important, what is the spatial scale at which people make their social comparisons?*
- *Happy People or Happy Places?*

Research methods:

- **Regression modelling**

single level analysis to investigate the association between “subjective happiness” and individual level explanatory variables

- **Multi-level modelling**

Assessing variation in happiness between people and places **simultaneously**

Combining Data

1991 & 2001 Census of UK population:
100% coverage
fine geographical detail
small area data
available only in tabular format with limited variables to preserve confidentiality

British Household Panel Survey:
sample size: more than 5,000 households
annual surveys since 1991
individual data
more variables than census
coarse geography
household attrition

Modelling happiness and well-being: single level models

1. Demography
2. Socio-economic
3. Health
4. Social context – interaction variables
(e.g. “unemployed or not” dummy variable x “district unemployment rate” variable)

	B	Std. Error	Sig.
Dependent variable: "unhappiness"			
Constant	-0.886	0.123	0.000
Age	0.033	0.006	0.000
Agesq	0.000	0.000	0.000
Female	0.195	0.024	0.000
Individual level LLTI			
University degree	0.024	0.040	0.549
Unemployed (reference group = "employed or self employed")	0.891	0.234	0.000
Retired (reference group = "employed or self employed")	0.019	0.345	0.957
Family care (reference group = "employed or self employed")	0.273	0.223	0.220
Student (reference group = "employed or self employed")	-0.054	0.081	0.505
Sick/disabled (reference group = "employed or self employed")	-0.657	0.589	0.265
On maternity leave (reference group = "employed or self employed")	-0.474	0.312	0.129
On a government scheme (reference group = "employed or self employed")	-0.307	0.185	0.098
Other job status (reference group = "employed or self employed")	0.242	0.448	0.590
Household income			
Couple no child (reference = "single")	-0.089	0.050	0.078
Couple with dependent children (reference = "single")	-0.025	0.050	0.619
Couple with no dependent children (reference = "single")	-0.063	0.056	0.262
Lone parent (reference = "single")	0.157	0.082	0.054
Lone parent non dependent children (reference = "single")	0.077	0.073	0.295
Other household type (reference = "single")	-0.025	0.074	0.732
Renting (reference = "owner occupier")	0.015	0.047	0.753
Local authority housing (reference = "owner occupier")	0.058	0.040	0.150
One car (reference = "no car")	0.049	0.040	0.218
Two cars (reference = "no car")	0.062	0.044	0.161
Three or more cars (reference = "no car")	0.038	0.056	0.497

Dependent variable: "unhappiness"

	B	Std. Error	Sig.
Constant	-0.886	0.123	0.000

District rates

Unemployment rate	0.016	0.039	0.692
Lone parent	0.010	0.028	0.710
Social housing	0.035	0.034	0.296
Sick/disabled	0.014	0.021	0.500
% "affluent"	0.060	0.040	0.132
% "poor"	0.013	0.026	0.630
% "households with one car"	0.002	0.026	0.926
% "households with two cars"	0.012	0.075	0.874
% "households with three cars"	-0.007	0.067	0.914

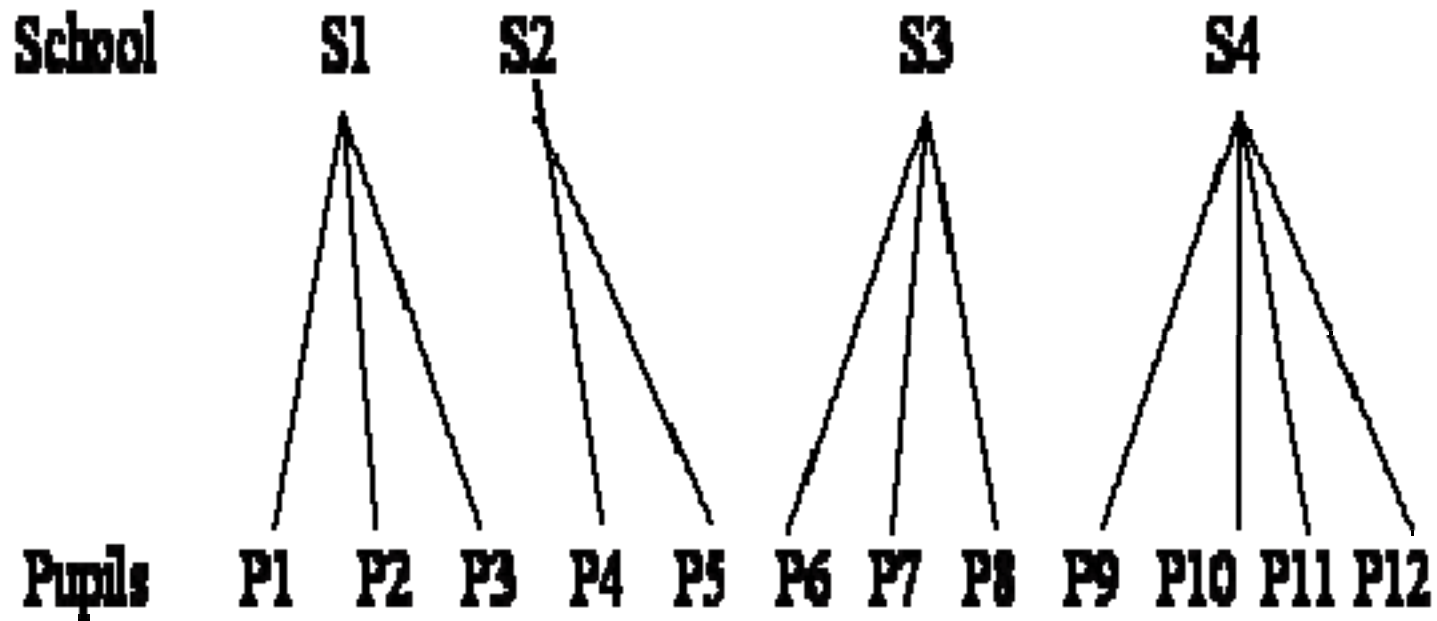
Interaction variables

unemployment	-0.846	0.235	0.000
no car	-0.031	0.033	0.353
students	-0.056	0.073	0.440
social housing	-0.070	0.042	0.093
private renting	-0.032	0.029	0.275
owner occupier	0.028	0.032	0.381
age 20-24	0.065	0.036	0.068
aged over 75	-0.127	0.251	0.612
"affluent"	-0.007	0.033	0.841
"middle"	-0.007	0.027	0.785
"poor"	0.001	0.026	0.963
sick/disabled	0.163	0.295	0.580

What is Multilevel Analysis?

- Many populations have a multilevel structure. E.g. Pupils in schools; people in local area. These are examples of 2 level structures:
 - Level 2 group (school; area)
 - Level 1 individual

Simple 2 level structure



What is Multilevel Analysis?

- Rather than deciding to analyse data at a single level. The group level (school; area) *or* at pupil level, it is better to consider several levels simultaneously with respect to the response variable
- A person's health or well being may partly vary by personal characteristics and partly area characteristics
- We can also think about more than 2 levels

Examples of multilevel relationships

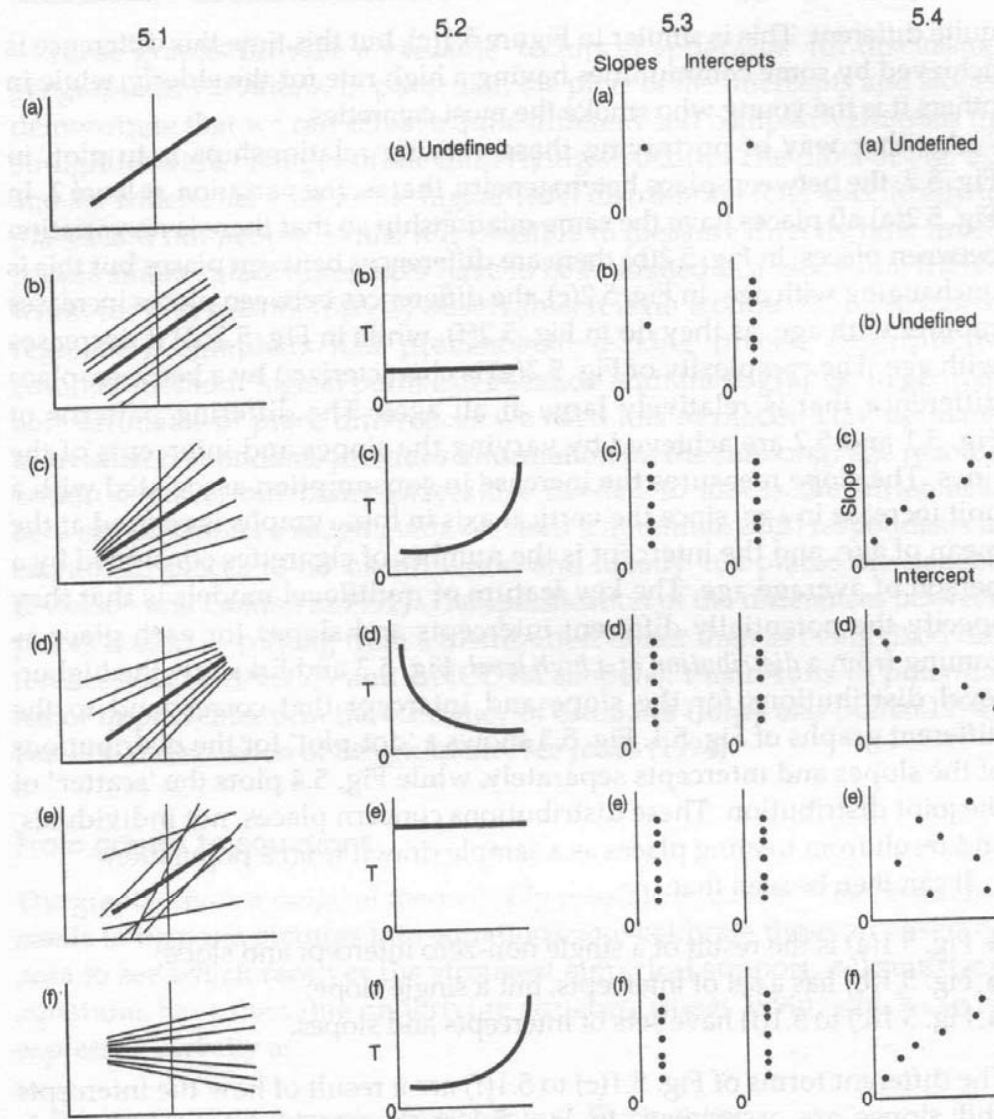


Fig. 5.1 Varying relationships between smoking and age

Fig. 5.2 Between-place heterogeneity

Fig. 5.3 Dot-plots of the higher-level distributions underlying Fig. 5.1

Fig. 5.4 Scatterplots of the higher-level distributions underlying Fig. 5.1

Terminology

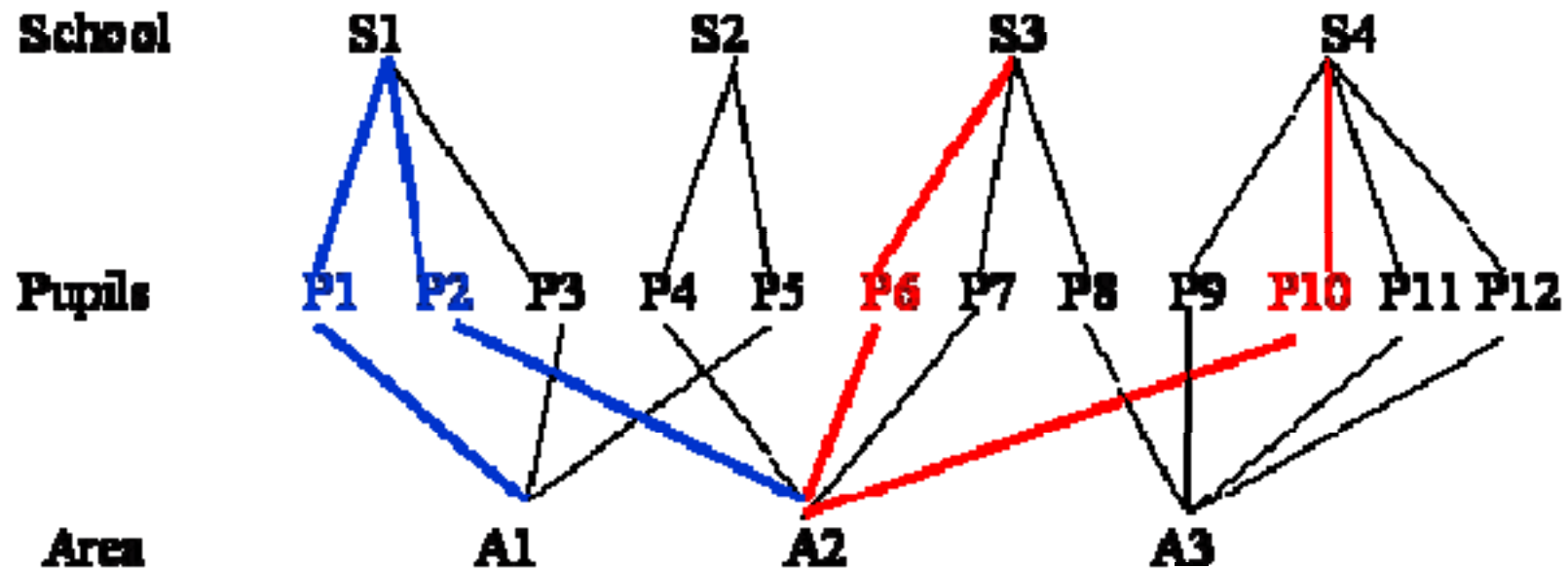
- **Nesting.**

Level $k-1$ units contained in level k units. E.g. classes at level 2 nested in schools at level 3. Classes are the level 2 units, schools are the level 3 units.

- **Cross classification.**

Non overlapping higher level units – school and neighbourhood at level 2, pupil at level 1.

Cross classified structure



Some substantive multilevel examples

- Areas: Variations in health

Level 3: Counties

Level 2: Districts

Level 1: people

- People: Dental data

Level 2: People's mouths

Level 1: teeth

Data requirements

- What are the data requirements for multilevel modelling?
- The standard requirements are to have available a dataset that includes indicators of the group to which individual unit belongs.
- For example information for a sample of pupils that includes an indicator of the school that they attend.
- Another example is a sample of individuals that includes an indicator of the area in which they live.

Multilevel modelling

- For multilevel modelling we would have information on a 'reasonable number of higher level units'
- What is 'reasonable'? Snijders and Bosker (1999) recommend at least 10 groups. 20 or more is better.
- We essentially assume we have a representative sample of higher level units in multilevel modelling, so 30 is a good number to have in mind.

Variance components model

$$y_{ij} = \beta_0 + u_j + e_{0ij}$$

$$\text{Var}(y_{ij}) = \sigma_u^2 + \sigma_e^2 = \sigma^2$$

i is the individual subscript

j is the area subscript

σ_u^2 measures variation in areas.

σ_e^2 measures variation in individuals.

Group level variables

- We can also add group level variables to the model, e.g. Pollution index, altitude; Unemployment rate.
- Notice how the group level data can be based on the aggregations of the individual units to the area level (e.g. unemployment rate) or a true characteristic of the area (e.g. altitude).

Combining data in a multilevel model

- Good framework for combining data
- E.g. Combine census data with survey data by area ID.
- Eg add district level unemployment data (based on census totals) to survey (BHPS) data.

Multilevel Analysis

World → Nation → Region →
District → Electoral Wards → Neighbourhood
→ Household → Individual

Multilevel modelling enables the analysis of data with complex patterns of variability – suitable to explore the variability of happiness at different levels

Multilevel Analysis

World → Nation → **Region** →
District → Electoral Wards → Neighbourhood
→ **Household** → **Individual**

Multilevel modelling enables the analysis of data with complex patterns of variability – suitable to explore the variability of happiness at different levels

See: <http://www.cmm.bristol.ac.uk/>

Modelling happiness and well-being: multilevel

1. “Null model” – extent of variation
2. Socio-economic variables and health – random intercepts
3. Social context – interaction variables

Multi-level modelling (4-levels: region, district, household, individual): “null model”

$$\text{UNHAPPINESSSTD}_{ijkl} \sim N(XB, \Omega)$$

$$\text{UNHAPPINESSSTD}_{ijkl} = \beta_{0ijkl} \text{cons}$$

$$\beta_{0ijkl} = -0.034(0.017) + f_{0l} + v_{0kl} + u_{0jkl} + e_{0ijkl}$$

$$[f_{0l}] \sim N(0, \Omega_f) : \Omega_f = [0.002(0.002)]$$

$$[v_{0kl}] \sim N(0, \Omega_v) : \Omega_v = [0.007(0.003)]$$

$$[u_{0jkl}] \sim N(0, \Omega_u) : \Omega_u = [0.141(0.014)]$$

$$[e_{0ijkl}] \sim N(0, \Omega_e) : \Omega_e = [0.814(0.017)]$$

$-2 * \log\text{likelihood(IGLS Deviance)} = 26755.820(9602 \text{ of } 9912 \text{ cases in use})$

Model 1 variance component estimates

Level	Variance	Variance (%)	SE
Region	0.002	0.21	0.002
District	0.007	0.73	0.003
Household	0.141	14.63	0.014
Individual	0.814	84.44	0.017

Model 2: socio-economic / health characteristics (1)

Model 2 Variables, variance component estimates and coefficients (standard error in brackets)	Subjective well-being	General Happiness
Intercept	0.766 (0.074)	0.607 (0.084)
<i>Individual-level variables:</i>		
Age	-0.016 (0.003)	-0.022 (0.003)
Female	-0.177 (0.021)	-0.068 (0.023)
Individual income	-0.012 (0.013)	0.007 (0.015)
Health good (reference = health excellent)	-0.200 (0.022)	-0.085 (0.024)
Health fair (reference = health excellent)	-0.510 (0.028)	-0.249 (0.031)
Health poor (reference = health excellent)	-0.963 (0.043)	-0.465 (0.047)
Health very poor (reference = health excellent)	-1.471 (0.073)	-0.790 (0.078)
University degree	-0.030 (0.038)	0.079 (0.040)
Employment status: unemployed (reference = employed or self employed)	-0.451 (0.043)	-0.384 (0.047)
Employment status: retired (reference = employed or self employed)	0.038 (0.041)	0.030 (0.044)
Employment status: family care (reference = employed or self employed)	-0.126 (0.035)	-0.078 (0.038)

Model 2: socio-economic / health characteristics (2)

Model 2 Variables, variance component estimates and coefficients (standard error in brackets)	Subjective well-being	General Happiness
Employment status: student (reference = employed or self employed)	0.048 (0.054)	0.022(0.059)
Employment status: sick/disabled (reference = employed or self employed)	-0.458 (0.063)	-0.158 (0.069)
Employment status: on maternity leave (reference = employed or self employed)	0.023 (0.258)	0.492 (0.281)
Employment status: on a government scheme (reference = employed or self employed)	-0.045 (0.153)	-0.274 (0.167)
Employment status: other job status (reference = employed or self employed)	0.082 (0.161)	0.163 (0.176)
Commuting time: up to 40 minutes	0.012 (0.032)	0.040 (0.034)
Commuting time: between 40 – 60 minutes	-0.048 (0.044)	0.024 (0.047)
Commuting time: over an hour	-0.087 (0.072)	-0.051(0.078)
Has lived at current address for between 1-5 years (reference = lived at current address for less than 1 year)	0.027(0.032)	-0.010(0.034)
Has lived at current address for more than 5 years (reference = lived at current address for less than 1 year)	0.120(0.031)	0.030(0.033)

Model 2: socio-economic / health characteristics (3)

Model 2 Variables, variance component estimates and coefficients (standard error in brackets)	Subjective well-being	General Happiness
<i>Household level variables:</i>		
Household type: couple no children (reference = single)	0.117 (0.034)	0.144 (0.036)
Household type: couple with dependent children (reference = single)	-0.030 (0.034)	0.047 (0.041)
Household type: couple with children but not dependent (reference = single)	0.037 (0.046)	0.078 (0.049)
Household type: lone parent with dependent child(ren)	-0.281 (0.058)	-0.092 (0.062)
Household type: lone parent with non dependent child(ren)	-0.051(0.060)	0.067(0.063)
Household type: other	0.098 (0.059)	0.176 (0.064)
Household tenure: private renting (reference = owner occupier)	-0.054 (0.038)	0.055(0.040)
Household tenure: LA/HA renting (reference = owner occupier)	-0.068 (0.028)	-0.011(0.029)
Number of cars	-0.010 (0.016)	0.003 (0.016)
Household income	0.028(0.015)	0.002(0.016)

Model 3: socio-economic / health and interaction (1)

Model 3 Variables, variance component estimates and coefficients (standard error in brackets)	Subjective well-being	General Happiness
Intercept	1.097 (0.117)	0.781 (0.133)
<i>Individual-level variables:</i>		
Age	-0.034 (0.006)	-0.032 (0.006)
Female	-0.195 (0.024)	-0.086 (0.028)
Individual income	-0.002 (0.015)	0.000 (0.017)
Health good (reference = health excellent)	-0.208(0.025)	-0.081 (0.028)
Health fair (reference = health excellent)	-0.506 (0.035)	-0.275 (0.040)
Health poor (reference = health excellent)	-0.725 (0.062)	-0.426 (0.071)
Health very poor (reference = health excellent)	-0.846 (0.144)	-0.642 (0.162)
University degree	-0.033 (0.039)	0.094 (0.044)
Employment status: unemployed (reference = employed or self employed)	-0.882 (0.234)	-0.690 (0.268)
Employment status: retired (reference = employed or self employed)	-0.148 (0.345)	-0.135 (0.369)
Employment status: family care (reference = employed or self employed)	-0.198 (0.217)	-0.334 (0.249)
Employment status: on maternity leave (reference = employed or self employed)	0.312 (0.280)	0.736 (0.321)

Model 3: socio-economic / health and interaction (2)

Model 3 Variables, variance component estimates and coefficients (standard error in brackets)	Subjective well-being	General Happiness
Employment status: student (reference = employed or self employed)	-0.022 (0.081)	0.066(0.093)
Employment status: sick/disabled (reference = employed or self employed)	0.601 (0.487)	0.493 (0.558)
Employment status: on maternity leave (reference = employed or self employed)	0.312 (0.280)	0.736 (0.321)
Employment status: on a government scheme (reference = employed or self employed)	0.289 (0.181)	0.056 (0.207)
Employment status: other job status (reference = employed or self employed)	-0.295 (0.484)	-1.256(0.554)
Commuting time: up to 40 minutes	0.006 (0.030)	0.034 (0.034)
Commuting time: between 40 – 60 minutes	-0.049 (0.041)	0.019 (0.047)
Commuting time: over an hour	-0.084 (0.068)	-0.056(0.077)
Has lived at current address for between 1-5 years (reference = lived at current address for less than 1 year)	0.037(0.036)	0.017(0.041)
Has lived at current address for more than 5 years (reference = lived at current address for less than 1 year)	0.100(0.036)	0.047(0.040)

Model 3: socio-economic / health and interaction (3)

Model 3 Variables, variance component estimates and coefficients (standard error in brackets)	Subjective well-being	General Happiness
<i>Household level variables:</i>		
Household type: couple no children (reference = single)	0.059 (0.048)	0.121 (0.054)
Household type: couple with dependent children (reference = single)	-0.008 (0.047)	0.061 (0.054)
Household type: couple with children but not dependent (reference = single)	0.046 (0.056)	0.084 (0.064)
Household type: lone parent with dependent child(ren)	-0.213 (0.076)	0.029 (0.087)
Household type: lone parent with non dependent child(ren)	-0.135(0.075)	0.113(0.085)
Household type: other	0.069 (0.077)	0.164 (0.086)
Household tenure: private renting (reference = owner occupier)	0.008 (0.047)	0.126(0.052)
Household tenure: LA/HA renting (reference = owner occupier)	-0.033 (0.040)	-0.004 (0.045)
Number of cars	-0.026 (0.018)	-0.025(0.020)
Household income	0.030(0.017)	0.006(0.019)

Model 3: socio-economic / health and interaction (4)

Model 3 Variables, variance component estimates and coefficients (standard error in brackets)	Subjective well-being	General Happiness
<i>Interaction (individual/household x district) terms:</i>		
Unemployment status (individual level) x unemployment rate (district level)	0.815 (0.235)	0.548(0.270)
Owner Occupier (household level) x owner occupier households rate (district level)	0.020 (0.016)	-0.009(0.017)
Private renting (household level) x private renting households rate (district level)	0.020(0.029)	0.015(0.032)
Renting from LA/HA x LA/HA renting households rate	0.029(0.030)	-0.038(0.033)
“Affluent” household (household level) x percentage of “affluent” households in the area (district level)	-0.021(0.025)	-0.007(0.29)
“Middle” household (household level) x percentage of “Middle” households in the area (district level)	0.030(0.019)	-0.001(0.21)
“Poor” household (household level) x percentage of “Poor” households in the area (district level)	0.016(0.019)	0.017(0.021)

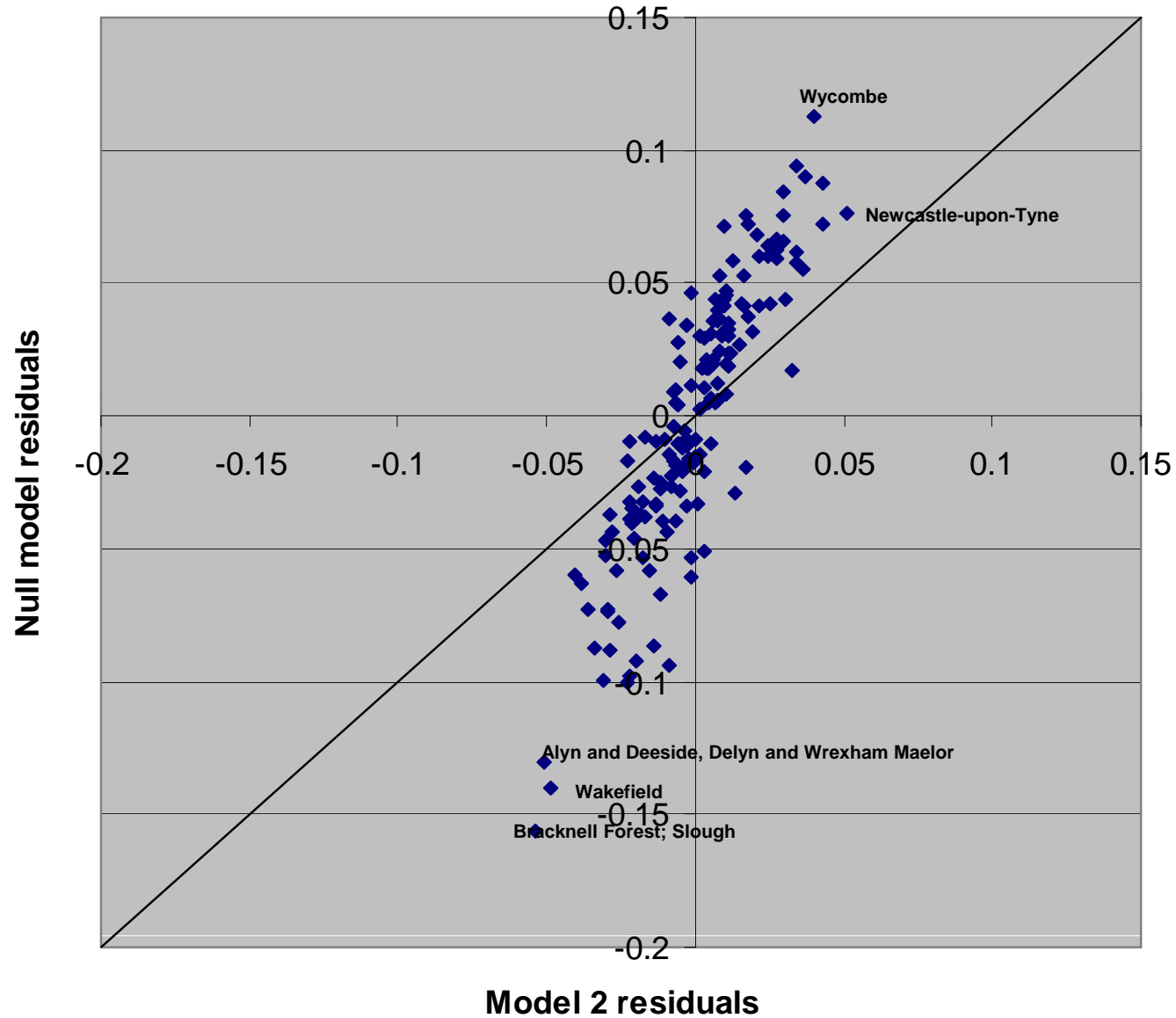
Model 2 and 3 significant main effects (1)

Happiness and well-being determinants	Model 2	Model 3
Age	HLGHQ1(-),GHQL(-)	HLGHQ1(-),GHQL(-)
Female (Reference = Male)	HLGHQ1(-),GHQL(-)	HLGHQ1(-),GHQL(-)
Health good (reference = health excellent)	HLGHQ1(-),GHQL(-)	HLGHQ1(-),GHQL(-)
Health fair (reference = health excellent)	HLGHQ1(-),GHQL(-)	HLGHQ1(-),GHQL(-)
Health poor (reference = health excellent)	HLGHQ1(-),GHQL(-)	HLGHQ1(-),GHQL(-)
Health very poor (reference = health excellent)	HLGHQ1(-),GHQL(-)	HLGHQ1(-),GHQL(-)
Employment status: unemployed (reference = employed or self employed)	HLGHQ1(-),GHQL(-)	HLGHQ1(-),GHQL(-)
Employment status: family care (reference = employed or self employed)	HLGHQ1(-),GHQL(-)	
Employment status: sick/disabled (reference = employed or self employed)	HLGHQ1(-),GHQL(-)	

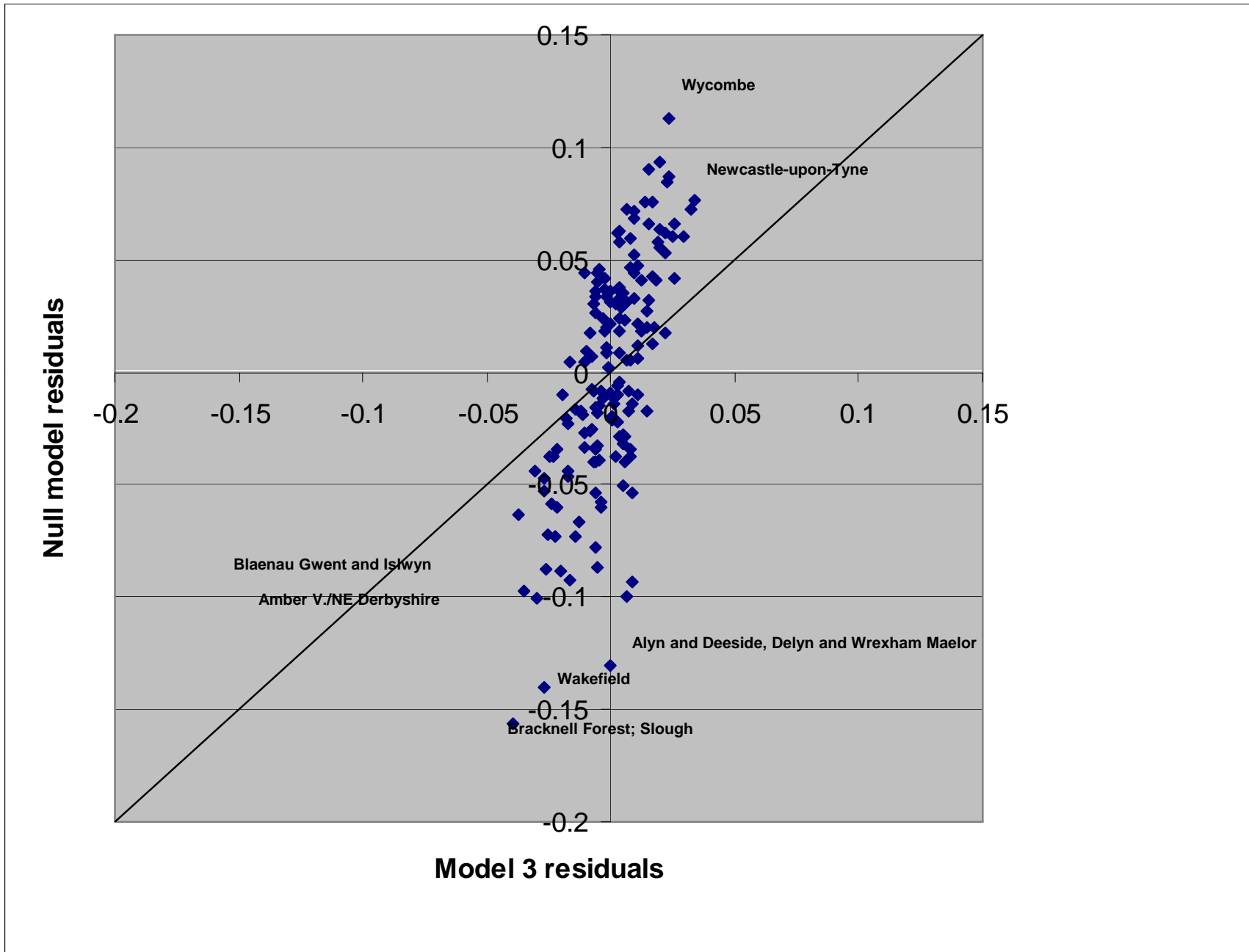
Model 2 and 3 significant main effects (2)

Happiness and well-being determinants	Model 2	Model 3
Employment status: on maternity leave (reference = employed or self employed)		GHQL(+)
Employment status: on a government scheme (reference = employed or self employed)		GHQL(-)
Employment status: other job status (reference = employed or self employed)		
Has lived at current address for more than 5 years (reference = lived at current address for less than one year)	HLGHQ1(+)	HLGHQ1(+)
Household type: couple no children (reference = single)	HLGHQ1(+),GHQL(+)	GHQL(+)
Household type: lone parent with dependent child(ren) (reference = single)	HLGHQ1(-)	HLGHQ1(-)
Household type: lone parent with non dependent child(ren) (reference = single)		
Household type: other (reference = single)	GHQL(+)	
Household tenure: private renting (reference = owner occupier)		GHQL(+)
Household tenure: LA/HA renting (reference = owner occupier)	HLGHQ1(-)	
Unemployment status (individual level) x unemployment rate (district level)	Not included	HLGHQ1(+),GHQL(+)

“Null model” vs. Model 2 residuals



“Null model” vs. Model 3 residuals



“Happy people” or “Happy places”?

- Most of the variation in the measures of “subjective well-being” and “general happiness” is attributable to the individual level
- **However**, some of the variation in both measures is attributable to the household level and a very small proportion of the variation of the “subjective well-being” measure is attributable to the district level

“Happy people” or “Happy places”?

- Variation of “subjective well-being” attributable to district & household levels reduced with the introduction of a number of explanatory and control variables.
- Area with lowest residual and therefore lowest “well-being” intercept is the district of **“Bracknell Forest; Slough”**.
- According to both Model 2 and Model 3, individuals living in this district have lower than average “subjective well-being”, **even after controlling for a number of explanatory variables thought to be affecting happiness.**
- **“Wycombe” has highest positive residual. However, the inclusion of a number of explanatory variables “drops” Wycombe to the third place, & first place goes to the district of “Newcastle-upon-Tyne”**