Understanding the Transformation of the Prospects of Place

Working Paper 1

The Townsend Poverty Survey and the 1971 Census

1. Introduction

There have been only four nationally representative scientific surveys of poverty in the past 50 years, listed below. All were funded by the Joseph Rowntree Foundation and two received additional funding from London Weekend Television. All were undertaken by academics, and all were relatively small.

- Poverty in the United Kingdom: a Survey of Household Resources and Standards of Living, 1967-1969, 2,052 households (Townsend, 1979)
- Living in Britain, 1983, 1,174 households, published as Poor Britain (Mack and Lansley, 1985)
- Breadline Britain, 1990, 1,831 households (Gordon and Pantazis, 1997)
- Poverty and Social Exclusion survey, 1,534 households (Gordon et al., 2000)

For the past 50 years, those concerned with poverty and inequality at a national level have had to rely either on the results from these small surveys or on the less than ideal Low Income Families series and its successor, the Households Below Average Income (HBAI) series, produced previously by the Department of Social Security and more recently by the Department for Work and Pensions.

However, and despite the restricted sample sizes, the above surveys reflect a broadly comparable relative approach to the definition and measurement of poverty. By adopting a synthetic modelling approach, it is therefore technically possible to examine the spatial distribution of area poverty over time based upon four discrete time slices: 1967-9 (1971 Census); 1983 (1981 Census); 1990 (1991 Census), and; 1999 (2001 Census) using a comparable methodology.

This approach involves the construction of reliable, valid and additive deprivation indices for each of the four surveys, and subsequently developing summary, binary indicators of 'poverty' based upon the 'fit' between material and social deprivation on the one hand, and net equivilised household income on the other. A different methodology is also described here for measuring the extent of 'core poverty' based on the overlap between low income, material and social deprivation and subjective poverty.

Using a logistic regression modelling approach the social and demographic predictors of poverty can then be estimated and the derived weightings applied to Census small area statistics. This paper describes the methodology used to derive the models relating to the 1971 Census of Population, based upon analysis of the 1967-1969 Survey of Household Resources and Standards of Living (henceforth referred to as the 'Townsend survey') (Townsend, 1979) with respect to 'poverty' and 'core poverty'. (Further details about the Townsend survey are contained in Appendix 2).

2. Choice of Indicators

The Townsend index of deprivation is a sub-set of a wider range of potential deprivation measures included in the 1967-69 survey. The items included in this index reflect a relative approach to the definition of poverty that focuses upon both the material and social dimensions of relative deprivation. For Townsend (1979: 1) individuals and households can be said to be objectively poor:

> …When they lack the resources to obtain the types of diet, participate in the activities which are customary, or are at least widely encouraged or approved, in the societies to which they belong. Their resources are so seriously below those commanded by the average individual or family that they are, in effect, excluded from ordinary living patterns, customs and activities

Peter Townsend's final deprivation index comprised twelve items and is reproduced in Table 1 (*below*), along with the proportion of the population lacking each item.

Table 1: Townsend Index Deprivation Measures, 1968-69

	%
Has not had a cooked breakfast most days of the week	67.3
Did not have a party on last birthday (*Under 15 only*)	56.6
Had not had a week's holiday away from home in the last 12 months	53.6
Has not had an afternoon or evening out for entertainment in the last two weeks	47.0
Has not been out in the last four weeks to a relative or friend for a snack or meal (*adults only*)	45.1
Household does not have a refrigerator	45.1
Has not had a friend to play or a friend to tea in the last four weeks (*Under 15 only*)	36.3
Has not had a relative of friend to the home for a meal or snack in the last 4 weeks (*adults only*)	33.4
Household does not usually have a Sunday joint (3 in 4 times)	25.9
Household does not have sole use of four amenities indoors (WC, sink, bath/shower, cooker)	21.4
Does not have fresh meat (including meals out) at least four days a week	19.3
Has gone through one or more days in the past fortnight without a cooked meal	7.0

Source: Townsend (1990: 250)

However, the Townsend Index was constructed before recent advances in computing which have since made it possible to develop much more sophisticated approached to examining the relative merits of different approaches to the operationalisation and measurement of relative deprivation. Indeed, how much difference does it make which index is used? Is there a best index of deprivation? In order to address these questions we need to examine the characteristics of competing indices in terms of their political plausibility, construct validity, reliability and additivity.

2.1 Creating a Preference-Free Index

Index items should be defensible on the grounds that the components are items that most people would be unlikely to want to do without. In the absence of data on preferences in the Townsend survey, (*ie.* on whether a household lacks items through choice or because they cannot afford them), only those items that were lacked by a minority of households were included. Table 2 (*below*) shows the proportion of households in which at least one person reported lacking the listed items. As Table 2 shows, a majority of households lacked the following items:

- Central heating (83.4%)
- A cooked breakfast (78.8%)

- A telephone (68.5%)
- A holiday away from home annually (57.5%)
- A record player (52.1%)

These items were excluded from further consideration on the grounds that if a majority of households lacked them it is not obvious in what sense they could be said to constitute necessities of life, the lack of which would constitute material or social deprivation

Table 2: Household's Lacking Deprivation Items, 1968-69.

No.	Item	% households lacking
13	Central heating	83.4
4	Cooked breakfast most days	78.8
17	Telephone	68.5
56	Holiday away from home in last 12mths	57.5
18	Record player	52.1
59	Been out for meal/snack with friends/relatives in last four weeks	50.0
16	Fridge	44.8
14	More than one room heated	44.3
20	Washing machine	41.2
58	Had friend for dinner/snack at home in last four weeks	36.4
10	New winter coat in the last three years (*housewife only*)	33.3
55	At least one evening/afternoon out in last two weeks	29.3
48	Air not dirty, smoky or foul-smelling	26.9
5	Usually has a joint on Sunday	26.0
2	Fresh meat most days	25.3
26	Home free of structural defects	22.0
21	Vacuum cleaner	21.9
46	Sole use of a garden or yard	18.0
54	Household spent more than £10 extra at Christmas	17.7
1	Cooked meal every day in last fortnight	12.2
6	Three pints of milk per week per person	11.3
15	Television	11.1
8	Income unit does not buy second-hand clothes	8.4
22	Carpet in main room	8.4
47	Garden large enough to sit in (100 sq yds or more)	8.3
19	Radio	7.5
27	Home free of structural defects dangerous to health	7.1
23	Chairs for all plus guest	5.3
12	Enough fuel to keep home warm	5.0
7	Adequate footwear for both wet and dry weather	2.6
11	Electricity for both power and lights	2.1

Source: Poverty in the United Kingdom: a Survey of Household Resources and Standards of Living

2.2 Validity

Validity refers to the extent to which a measuring instrument measures what it purports to measure. However, establishing the validity of a measuring instrument is a complex problem, not least because the concept itself is quite elastic and, in some respects, less amenable to statistical analysis than other related concepts such as reliability or additivity. In addition to subjectively assessing the extent to which indicators 'look' like valid measures ('face validity'), validation exercises typically seek to determine the extent to which experimental measures correlate with some criterion measure whose validity is already known and accepted – 'construct validity'.

Establishing validity is can be complex. However, the simplest way to achieve this is to ensure that the individual components of the index are all highly correlated with independent indicators known to be strongly associated with poverty. This can be done by calculating the relative odds ratios for the components against established correlates of poverty whilst controlling for other factors known to co-vary with these indicators using logistic regression. In this case the following indicators have been used:

- **General health:** health in last 12 months 'poor' or 'fair' (controlling for age and sex)
- **Disability:** health condition which limits daily activity (controlling for age and sex)
- **Subjective poverty:** head of household feels genuinely poor 'all the time' (controlling for household size and composition)
- **Income Adequacy:** head of household finds it difficult to manage on current household income all or most of the time (controlling for household size and composition)

The results of these analyses are shown in Table 3 (*below*). Table 3 shows that households in which at least one person has gone without a cooked meal at least once in the last two weeks are 67% (1.67 to 1) more likely to feel subjectively poor than households who have not done so. They were also more than twice as likely (2.28 to 1) to contain at least one household member who suffered from a limiting illness than households in which no one had gone without a cooked meal in the last two weeks.

Items in bold indicate those items for which we cannot be confident that the sample estimates reflect the underlying population parameters. For example, we cannot be certain of the effect of lacking a TV on the odds of subjective poverty, income adequacy, general health, and limiting illness because the sample estimate is not significant at the 95% level ($p<.05$). In this case we should exclude the item from the index because we cannot be confident that it is associated with these established covariates of poverty. However, one problem with this approach is that running multiple tests means that we can expect 1 in 20 items to be misclassified, (*ie.* shown as not significant when in reality they are or vice versa). For this reason, items should only be excluded where they are not significant on at least two or more tests, where the probability of Type 1 or Type 2 errors is extremely small.

Table 3: Odds Ratios for Townsend Index Deprivation Items – Criterion Validation, 1968-69.

	Subjective Poverty[1]	Income Adequacy[1]	General Health[2]	Limiting condition[2]
Cooked meal every day in last fortnight	1.67	1.89	1.87	2.28
Fresh meat most days	3.68	3.14	1.95	1.97
Usually has a joint on Sunday	2.00	2.09	1.31	1.33
Three pints of milk per week per person	1.48	1.53	1.36	1.35
Adequate footwear for both wet and dry weather	7.03	5.59	3.26	2.49
Does not buy second-hand clothes	3.39	2.71	2.24	1.90
New winter coat in the last three years (*housewife only*)	2.80	2.29	1.70	1.38
Electricity for both power and lights	3.84	2.54	**1.14**	**0.82**
Enough fuel to keep home warm	13.58	11.31	3.43	2.38
More than one room heated	1.91	1.61	1.22	1.19
Television	**1.25**	**1.22**	**1.08**	**1.18**
Fridge	3.11	1.90	1.72	1.36
Radio	2.99	2.95	2.39	1.51
Washing machine	2.40	1.97	1.43	1.47
Vacuum cleaner	2.71	1.87	2.35	1.98
Carpet in main room	2.95	2.11	2.28	1.82
Chairs for all plus guest	3.14	2.09	1.80	1.55
Home free of structural defects	1.63	1.34	2.02	2.01
Home free of dangerous structural defects	2.61	2.06	3.75	2.73
Sole use of a garden or yard	1.76	1.54	1.27	1.45
Garden large enough to sit in	1.47	**1.27**	1.47	**1.30**
Air not dirty, smoky or foul-smelling	1.31	1.32	1.51	1.39
Spent more than £10 extra at Christmas	5.37	3.60	2.19	1.86
Evening/afternoon out in last two weeks	**0.98**	**0.89**	**1.25**	0.72
Friend for dinner at home in last four weeks	1.31	1.41	1.22	**1.19**
Central heating	3.68	2.30	1.51	1.46
Cooked breakfast most days	**1.04**	**1.08**	**1.16**	1.27
Phone	2.73	1.65	1.79	1.45
Holiday away from home in last 12mths	2.57	2.34	1.41	1.60
Record player	2.27	1.75	1.40	1.24
Been out for meal in last four weeks	1.48	1.47	1.25	1.22

Source: Poverty in the United Kingdom: a Survey of Household Resources and Standards of Living
Bold = Not significant at .05 level
[1] Controlling for household composition and size
[2] Controlling for age and sex

Table 4 (*below*) summarises the relationships described above by showing the number of non-significant relationships for selected potential component indicators. We should probably exclude the following items from our index:

- Television
- At least one evening/afternoon out in last two weeks
- Cooked breakfast most days

- Electricity for both power and lights
- Garden large enough to sit in (100 sq yds or more)

Table 4: Possible Invalid Indicators: Number of non-significant indicators, 1968-69.
Scores of 2+ denote probable lack of validity.

	Number of non-significant indicators
Television	4
At least one evening/afternoon out in last two weeks	3
Cooked breakfast most days	3
Electricity for both power and lights	2
Garden large enough to sit in (100 sq yds or more)	2
Had friend for dinner/snack at home in last four weeks	1

Source: Poverty in the United Kingdom: a Survey of Household Resources and Standards of Living

Finally**,** the indicators were re-validated against PSE equivilised net weekly household income. We should expect that for valid indicators the mean incomes of households who lack the scale components would be significantly lower than for those that have them, and this proposition can be tested using one-way analysis of variance. There were no instances in which the incomes of those lacking the item were higher than for those who had the item.

In most of these cases the differences in mean equivilised incomes between those who lacked the item and those who did not were substantial and statistically significant at the 95% confidence level. However, in the case of access to 'sole use of a garden or yard' differences were very small and we thus cannot be confident that these estimates reflect population parameters at the 95% confidence level. In addition to the items described above, this item was also excluded from the overall index.

2.3 Reliability

In scientific terms, a reliable measurement is not necessarily correct but it is precise. The concept of reliability suggests thus that repeated measurements of the same phenomenon should produce consistent results. For example, repeated measures an object with a one-foot ruler, which in reality was only 11 inches long, would produce a series of very similar measurements. This series of measurements would be highly reliable even though they were completely inaccurate!

Since reliability is concerned with the consistency of measures, and not their accuracy, a number of statistics are available to measure the internal reliability of deprivation indices. The most widely used of these is classical test theory (eg. Cronbach's Alpha). Table 5 (*below*) shows the results of classical reliability analysis for those items that are both politically acceptable and valid according to the above criteria. Items are unreliable (highlighted in bold) if their removal results in an improvement in the scale Alpha of the index. The following item should be excluded due to a lack of reliability:

- Air not dirty, smoky, or foul smelling

Table 4: Classical Reliability Analysis – valid items lacked by at least 50% of households.

	Item-Total Correlation	Alpha if Item Deleted
Cooked meal every day in last fortnight	0.173	0.732
Fresh meat most days	0.402	0.714
Usually has a joint on Sunday	0.281	0.725
Three pints of milk per week per person	0.190	0.730
Adequate footwear for both wet and dry weather	0.233	0.730
Income unit does not buy second-hand clothes	0.164	0.732
New winter coat in the last three years (housewife only)	0.349	0.719
Enough fuel to keep home warm	0.331	0.724
More than one room heated	0.307	0.723
Fridge	0.470	0.706
Radio	0.277	0.726
Washing machine	0.391	0.714
Vacuum cleaner	0.467	0.709
Carpet in main room	0.370	0.721
Chairs for all plus guest	0.223	0.729
Home free of structural defects	0.296	0.723
Home free of structural defects dangerous to health	0.311	0.724
Air not dirty, smoky or foul-smelling	**0.107**	**0.740**
Household spent more than £10 extra at Christmas	0.454	0.711
Had friend for dinner/snack at home in last four weeks	0.218	0.732
Been out for meal/snack (last four weeks)	0.231	0.731
	Cronbach's Alpha= .7333	

Source: Poverty in the United Kingdom: a Survey of Household Resources and Standards of Living
(Excluding the above item the final scale reliability is .741).

2.4 Additivy

It is clearly important that the components of any deprivation index should be additive. For example, if a hypothetical deprivation index is composed of two variables - such as car and TV ownership - then we should be confident that households who lack both a TV and a car are likely to be poorer than those who lack only one of these items.

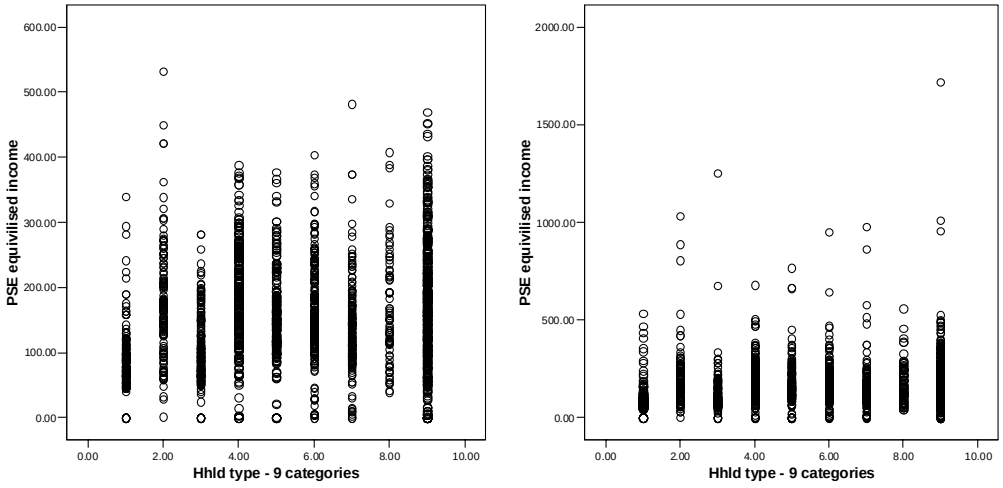
Standard statistical techniques can be used to establish additivity. Clearly, the most basic criterion is that the simple correlations between all variables included in the index should be positive. Secondly, first-order interactions can be examined by performing partial correlation plots. Finally, fully saturated ANOVA and GLM models can be used to examine higher order interactions.

Removing Outliers

However, before doing so it is essential to remove large outliers since there is always somebody in a survey who says they earn £1,000,000 but can't afford any item on the deprivation index! Even after equivilisation using the PSE scale and separating out different household types, outliers still remain. Panel B of Figure 1 (*below*) shows the raw data for equivilised net household income by household type. In order for the poverty line to not be unduly affected by a few households with very large incomes these cases

should be removed from the model. The effects of excluding the wealthiest 2% of households from the poverty threshold analysis are shown in Panel A. Here, for each household type, those households with net equivilised income within the wealthiest 2% of the distribution have been excluded. This amounts to 44 households, or 2.3% of the original sample.

Figure 1: Outliers by Household Type, 1968-69



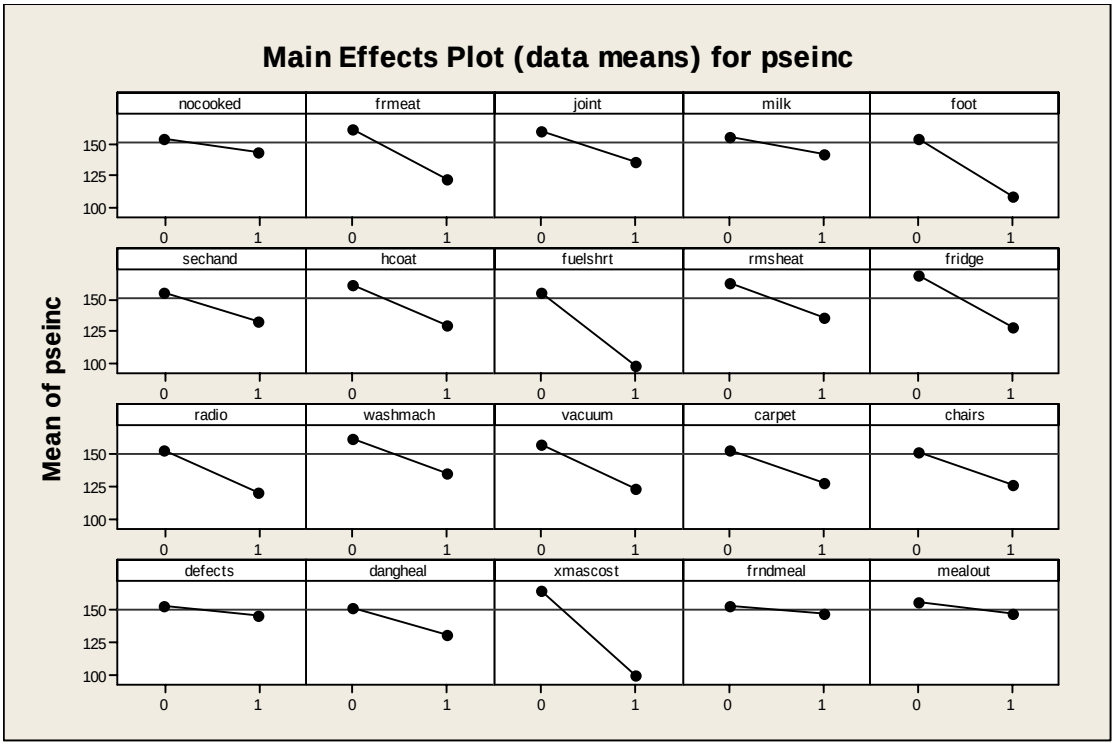
Panel A *Panel B*

Household types: 1=single pensioner; 2=single; 3=pensioner couple; 4=couple no children; 5=couple, 1 child; 6=couple, 2 children; 7=couple, 3+ children; 8=lone parent; 9=other

Source: Poverty in the United Kingdom: a Survey of Household Resources and Standards of Living

Determining Additivity: Main Effects and Interaction Plots

The main effects plots shown in Figure 2 (*below*) illustrate the mean amount of equivilised net household income of respondents who lack an item (black dot on right of graph) compared with the income of those who reported having the item for each of the 17 remaining deprivation items. The dotted line is the average equivilised net household income for the sample as a whole (£151 per week). As the first plot shows, households where at least one member has reported going without at least one cooked meal in the previous fortnight have a lower equivilised household income than those who did not. For all items, those households reporting lacking these items have lower mean equivilised incomes than those households who have the item, though in some cases the mean differences are small and not statistically significant.



Source: Poverty in the United Kingdom: a Survey of Household Resources and Standards of Living

All possible second order interaction plots between these items are shown in Appendix 1 (*below*). The graphs show the interaction between each item and the other reliable, valid and politically plausible items. In each case, the vertical scale on each graph is equivilised net household weekly income which ranges between £100 and about £175. The horizontal scale indicates whether or not a household can afford the item (*ie.* don't have=1, have=0). There are two lines on the each graph – a solid black line and a dotted red line. The first black dot on the solid line (top left) shows the average equivilised net household income of those households who had both items. The first red dot on the dotted line (on the left) shows the income of those who could afford only one item X. The second black dot on the solid line (top right) shows the income of those who can't afford item Y but have item X, and the second red dot on the dotted line shows the average equivilised net household incomes of respondents who don't have either items X or Y. Therefore respondents who don't have either items are should be the 'poorer' than households who can't afford just one of these items.

Basically two parallel lines slanting from top left to bottom right are good (*eg.* the variables are additive). However, if the lines cross there may be problems such that the variables are not additive, and the angle of intersection denotes the degree of non-additivity. Note however, that there are likely to be a few graphs with crossing lines due to multiple test effects so we should only get concerned if there are variables which do not appear to be additive with several other variables. The relationships detailed in Appendix 2 are summarised in Table 5 (*below*), which shows the number of possible interaction effects for each variable.

Table 5: Summary of ANOVA Interaction Plots, 1968-69.

	Number of interactions
Cooked meal every day in last fortnight	7
Three pints of milk per week per person	6
Chairs for all plus guest	3
More than one room heated	2
Home free of structural defects	2
Had friend for dinner/snack at home in last four weeks	1
Been out for meal/snack with friends/relatives in last four weeks	1
Fresh meat most days	1
Usually has a joint on Sunday	1
Adequate footwear for both wet and dry weather	1
Income unit does not buy second-hand clothes	1
New winter coat in the last three years (housewife only)	1
Enough fuel to keep home warm	1
Fridge	1
Washing machine	1
Carpet in main room	1
Household spent more than £10 extra at Christmas	1
Radio	0
Vacuum cleaner	0
Home free of structural defects dangerous to health	0

Source: Poverty in the United Kingdom: a Survey of Household Resources and Standards of Living

Table 5 suggests that whilst there is some evidence of additivity for many of these indicators the problems appear to be mainly associated with the following two variables:

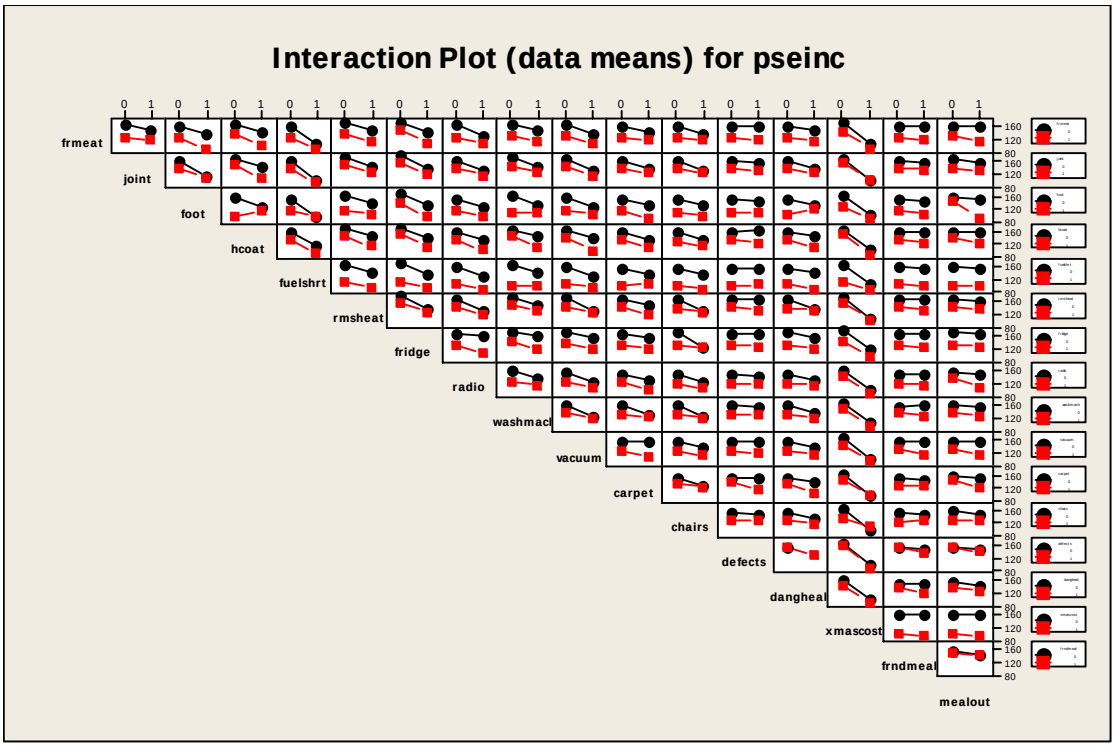
- Cooked meal every day in last fortnight (7 interactions)
- Three pints of milk per person per week (6 interactions)

These variables have therefore been excluded from the final index. When these variables are removed from the index the reliability of the index must be re-assessed based upon classical reliability analysis. Re-running the reliability analysis on these variables suggests that the following variable should be removed to maximise scale Alpha, since the item's correlation with the index (.143) is relatively low:

- Income unit does not buy second-hand clothes

Some selected characteristics of the final index are shown below, namely interaction plots for the selected indicators (Figure 3) and the results of classical reliability analysis (Table 6).

Figure 3: ANOVA Interaction Plots - Final Index Items, 1968-69.



Source: Poverty in the United Kingdom: a Survey of Household Resources and Standards of Living

Table 6: Classical Reliability Analysis – Final Index Items, 1968-69.

	Item-Total Correlation	Alpha if Deleted
Fresh meat most days	0.376	0.703
Usually has a joint on Sunday	0.274	0.714
Adequate footwear for both wet and dry weather	0.228	0.719
New winter coat in the last three years (housewife only)	0.341	0.707
Enough fuel to keep home warm	0.322	0.713
More than one room heated	0.293	0.714
Fridge	0.457	0.693
Radio	0.253	0.716
Washing machine	0.388	0.702
Vacuum cleaner	0.445	0.697
Carpet in main room	0.314	0.713
Chairs for all plus guest	0.210	0.719
Home free of structural defects	0.281	0.714
Home free of structural defects dangerous to health	0.284	0.714
Household spent more than £10 extra at Christmas	0.451	0.697
Had friend for dinner/snack at home in last four weeks	0.242	0.720
Been out for meal/snack in last four weeks	0.231	0.722
	Cronbach's Alpha= .723	

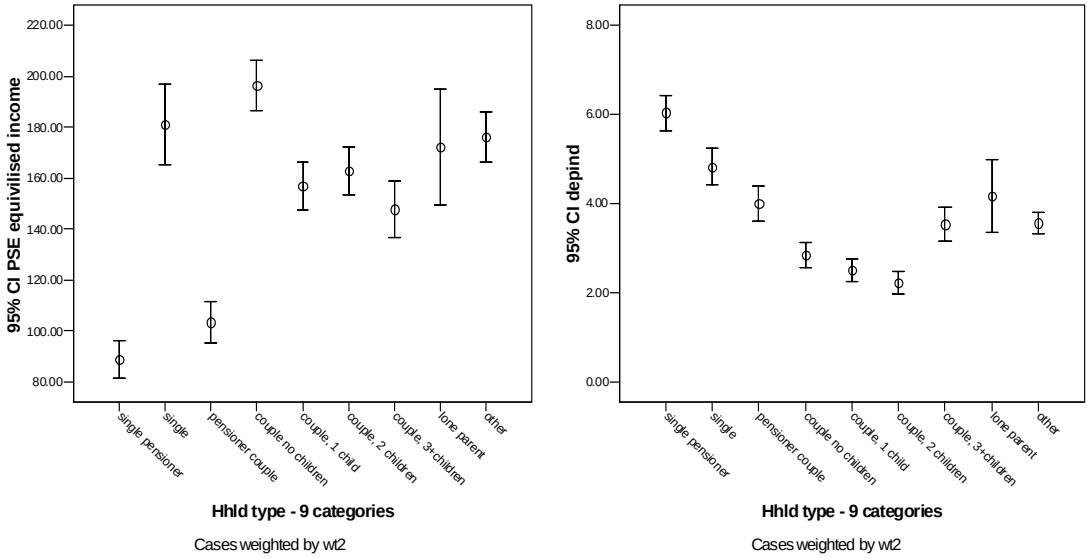
Source: Poverty in the United Kingdom: a Survey of Household Resources and Standards of Living

A further 13 further households were deleted from the file as a result of examining the data for bivariate outliers on the final index against PSE equivilised income. In addition to the earlier 46 cases removed, the final unweighted sample size for the household file is 1,898 households.

In the analyses that follow a post-stratification weight has been applied to the household data in order to ensure their representativeness with respect to 1971 Census small areas statistics data. The household data are weighted by household type (7 categories) and by the Socio-Economic Group of Head of Household (chief wage earner)[1].

The relationship between PSE equivilised income (pseinc) and levels of observed deprivation (depind) is described by the following linear equation: pseinc = £189.65 - £9.32*depind. Figure 4 (*below*) summarises mean deprivation index scores on this 18-point scale alongside mean levels of PSE equivilised income by household type.

Figure 4: Mean Deprivation Scores and Equivilised Household Income by Household Type, 1968-1969.



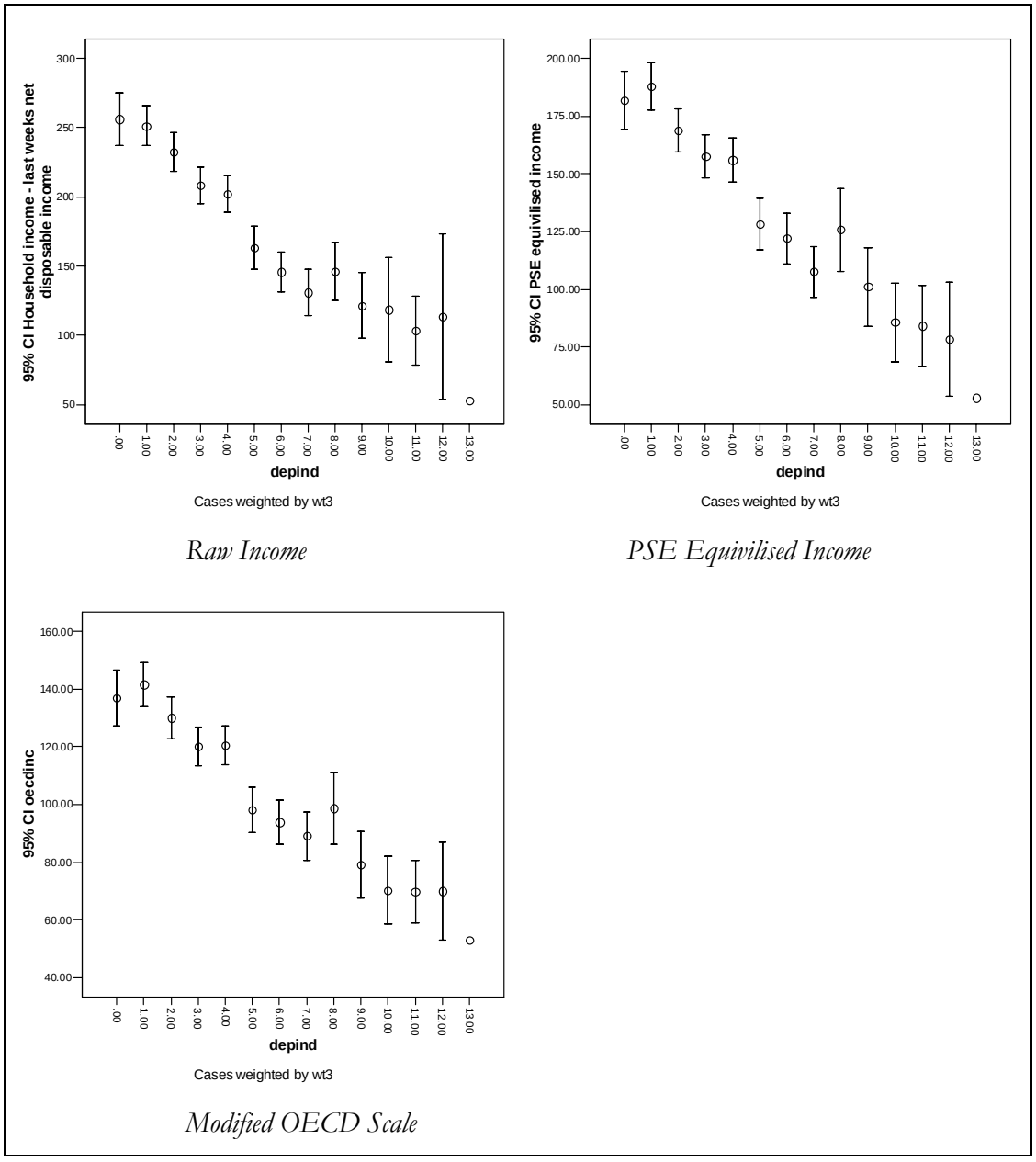
Source: Poverty in the United Kingdom: a Survey of Household Resources and Standards of Living (Data weighted by household type and SEG)

[1] The household types consistent with 1971 Census definitions are: single pensioner; single person; lone parent with children (aged 14+); pensioner couple; couple; couple with children (aged 14+); other. The weighting has the following distribution: min=0.05, max=2.89, mean=1.00, stddev=0.724.

3. Establishing the Deprivation Threshold

Determining the optimal deprivation threshold seeks to establish that level of income at which the incidence of deprivation begins to increase disproportionately. Figure 5 (*below*) presents data on mean levels of income based upon raw income data, and PSE and OECD equivilised income at various deprivation levels. Visual inspection of these plots suggests that lacking five or more deprivation items is likely to be the optimal deprivation threshold. Beyond this level household income tends to tail off quite quickly.

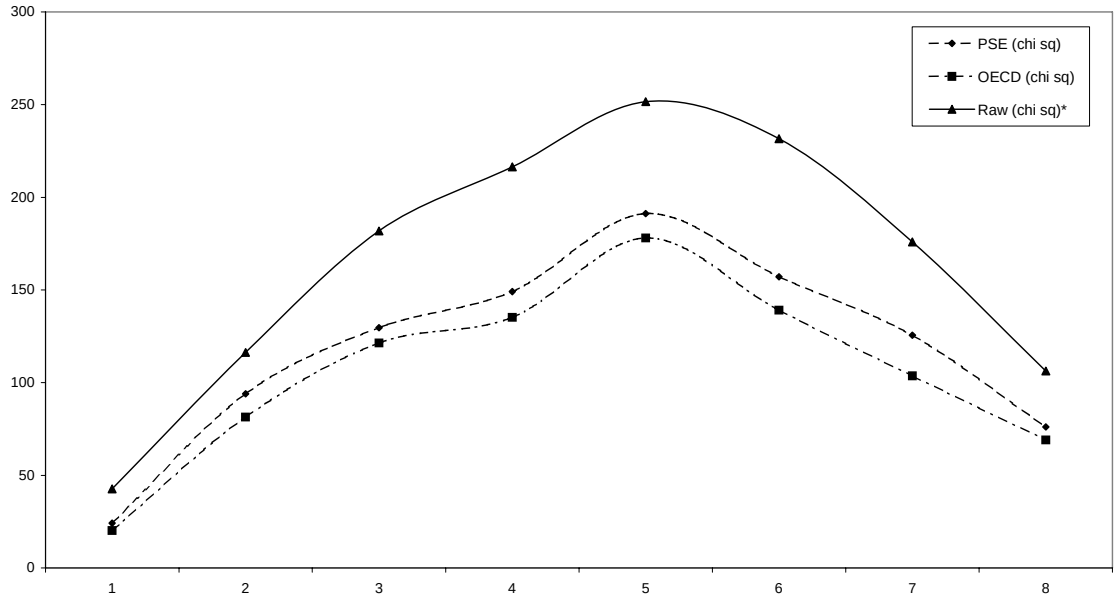
Figure 5: Mean Household Income by Level of Deprivation Level.
Raw income, PSE equilivised income, modified OECD equivilised income



Source: Poverty in the United Kingdom: a Survey of Household Resources and Standards of Living
(Data weighted by household type and SEG)

However, in order to determine the degree of 'fit' between low income and deprivation it is necessary to explore the relationship between household income and deprivation using more advanced modelling techniques such as logistic regression analysis and analysis of variance. Figure 6a (*below*) plots model chi square statistics for the relationship between income and deprivation at various deprivation thresholds and for different models of household income (*ie.* raw income, PSE and OECD equivilised. These data appear to confirm that the relationship between income and deprivation is most powerful when we operationalise deprivation at the 5+ deprivation threshold.

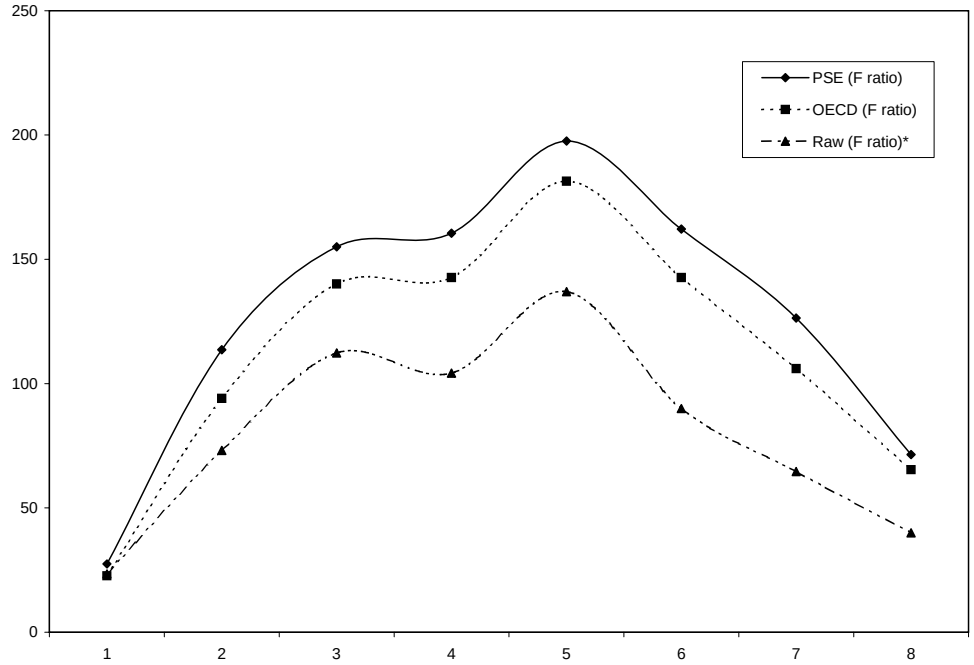
Figure 6a: The Fit Between Household Income and Deprivation, 1968-69.
Logistic regression model chi square values (all significant at .001 level).



* Controlling for household composition (raw income)
Source: Poverty in the United Kingdom: a Survey of Household Resources and Standards of Living

However, to some extent these results may be method-dependent, not least because the statistical power of logistic regression is limited in comparison with some other statistical techniques such as analysis of variance. Figure 6b (*below*) therefore adopts a similar approach to model the relationship between income and deprivation based upon analysis of variance by plotting F-statistics for various threshold values of deprivation. Whilst there are some slight variations depending on the method of analysis (and the type of equivilisation used, if any), these data nonetheless confirm that the optimal deprivation threshold is set at the 5+ level. Based upon the above approach to assessing the fit between income and deprivation, the deprivation level was set at the 5+ level indicating that those households (30.0% of the sample) who lacked five or more of the items included in the final index were categorised as deprived.

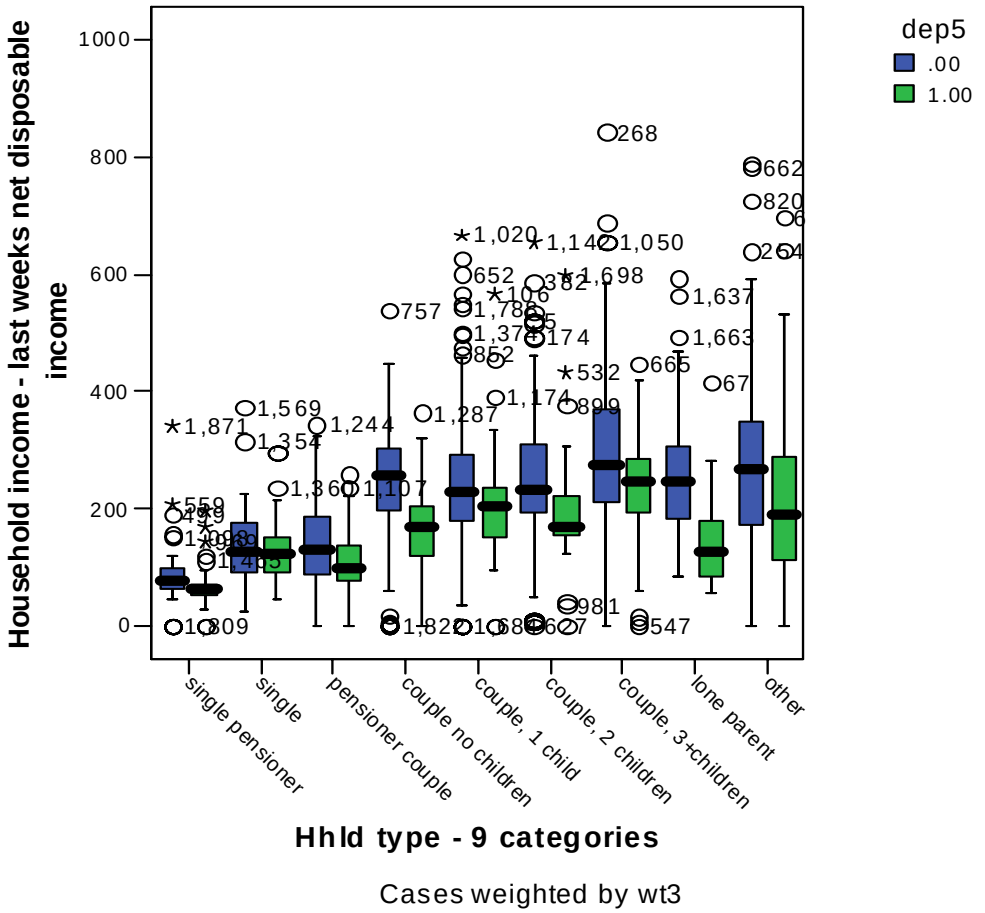
Figure 6b: The Fit Between Household Income and Deprivation.
Univariate ANOVA Main Effects models, F ratios (all significant at .001 level).



* Controlling for household composition (raw income).
Source: Poverty in the United Kingdom: a Survey of Household Resources and Standards of Living

Given the problems of equivilisation, setting the poverty threshold is best achieved on the basis of analysis of the relationship between raw income and deprivation *by household type*. The distribution of income by deprivation status (poor/non-poor) and household type (based upon nine household categories) is shown in Figure 7 (*below*). Conceptually, households may be considered to be rising out of poverty if they are deprivation poor but have incomes which are atypically high for poor households. (These are the upper outliers in the boxplot columns labelled 'dep5=1'). Households may be considered to be vulnerable to poverty if they are not deprivation poor but have incomes which are lower than the mean for poor households. (These are shown in boxplot columns labelled 'dep5=0').

Figure 7: Boxplots of Raw Household Income by Deprivation Status and Household Type, 1968-69.



Source: Poverty in the United Kingdom: a Survey of Household Resources and Standards of Living (Data weighted by household type and SEG)

3. The Incidence of Poverty

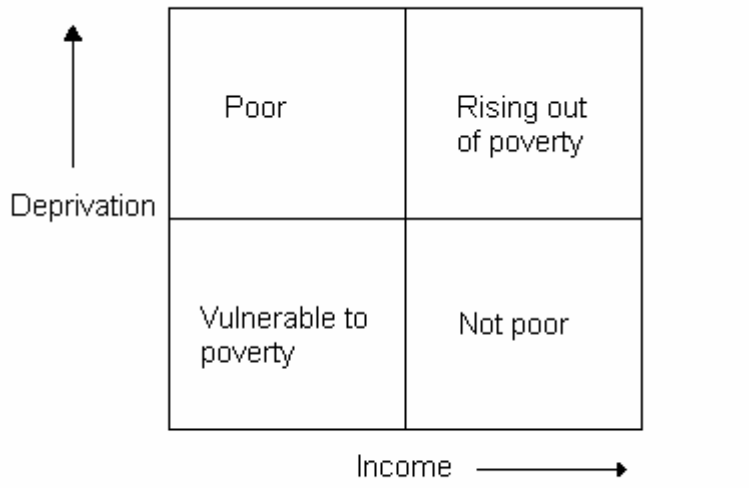
3.1 Poverty

Based upon this classification the proportion of household in 1968 within each group is given below:

Poverty Rates, 1968-60	
Not poor	52.7%
Vulnerable to poverty	17.6%
Poor	24.9%
Rising out of poverty	4.9%

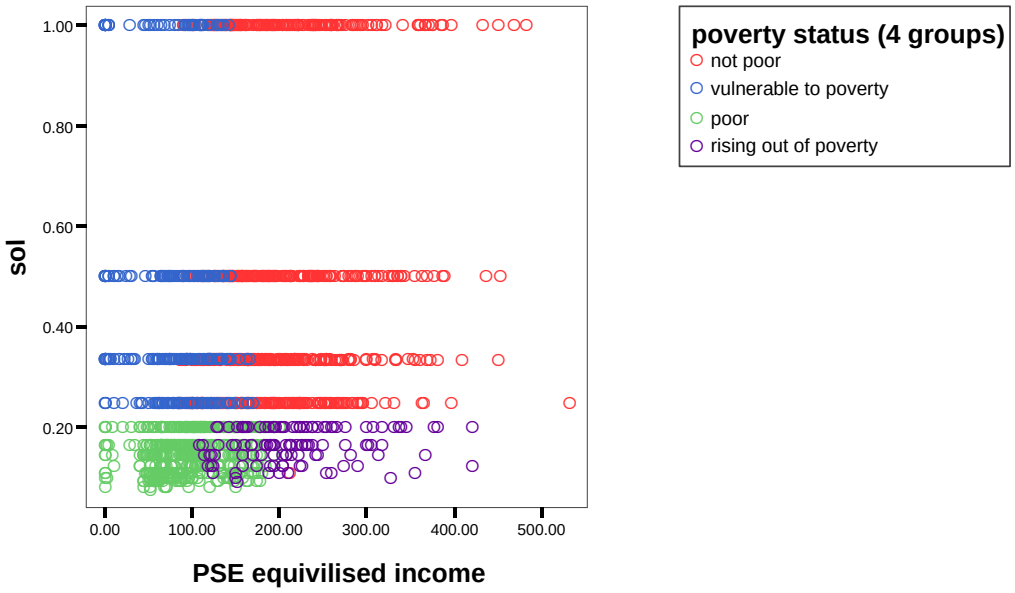
Source: Poverty in the United Kingdom: a Survey of Household Resources and Standards of Living
(Data weighted by household type and SEG)

Ideally we would expect to find a clear separation between these different groups when we plot household score by deprivation score and equivilised income. In theory, we would expect 'poor' households to have low incomes and high deprivation scores, and that those 'vulnerable to poverty' would have relatively low deprivation scores but also low incomes. Conversely, we should also expect that 'not poor' households would have low deprivation scores and relatively high incomes and that those 'rising out of poverty' would have relatively high deprivation scores but also high incomes. This is illustrated conceptually below:



This pattern of results is broadly replicated by the empirical data presented in Figure 8 (*below*). This scatterplot examines the relationship between levels of observed household deprivation and net weekly equivilised household income for each of the four groups identified above. These data show that there is a high degree of separation between groups and that these data conform quite closely to the theoretical model described above.

Figure 8: The Relationship Between Standard of Living and Household Income by Poverty Status, 1968-69.



Source: Poverty in the United Kingdom: a Survey of Household Resources and Standards of Living (Data weighted by household type and SEG)

Core Poverty

The concept of 'core poverty' is also used here to describe those households which are simultaneously income poor, deprivation poor and subjectively poor. The analyses outlined here use the following definitions of these terms:

Income Poverty Equivilised net weekly household income less than a set proportion of equivilised net weekly household income of all households sampled (*eg.* 60% mean, 60% median, 70% median)

Deprivation Poor Following Whelan et al. (2001) deprivation is operationalised here by the Basic Deprivation Index in which a household is said to be poor if they respond positively to any of the following statements:

- In arrears on rent, utilities and HP
- Buy new not second hand clothes
- Cannot afford meat, chicken or fish every second day
- Cannot afford to keep home adequately warm
- Cannot afford to replace worn out furniture
- Cannot afford a week's annual holiday away from home
- Cannot afford to have friends/family for a meal once a month

Subjectively Poor The Head of Household (chief wage earner) in the Townsend Survey was asked the following question of their household circumstances: "Do you think you could genuinely say you are poor now?" Respondents who answered positively (*ie.* 'all the time' and/or 'sometimes') can be considered to be subjectively poor.

However, clearly the proportion of households classified as 'core poor' depends on where the income poverty threshold is set, and whether we consider as subjectively poor only those who felt themselves to be poor 'all the time' or include also those who felt themselves to be poor 'sometimes'. The overall weighted frequencies using these different thresholds are shown below:

	'Always poor'	'Sometimes'/'always poor'
60% mean income	6.3%	16.4%
60% median income	6.3%	16.4%
70% median income	6.5%	17.7%

Source: Poverty in the United Kingdom: a Survey of Household Resources and Standards of Living
(Data weighted by household type and SEG)

Households are defined as 'core poor' if their equivilised household income is less than 70% of the median *and* they are deprivation poor (according to the Basic Deprivation measure) *and* they consider their household to be poor 'sometimes' or 'all the time' – encompassing nearly 11% of households in the sample. Based upon this definition, about one household in six (17.7%) is 'core poor'. Table 7 (*below*) shows the distribution of poverty and of core poverty at the household level by household type.

Table 7: Poverty and Core Poverty by Household Type, 1968-1969.

	Poor	**Core Poor**
Single pensioner	57.7	38.3
Single person	36.4	13.2
Pensioner couple	31.3	23.4
Couple, no children	18.8	8.0
Couple, one child	12.3	16.3
Couple, two children	11.7	15.5
Couple, 3+ children	22.4	20.9
Lone parent	32.0	25.0
Other	21.1	15.8
ALL	24.9	17.7

Source: Poverty in the United Kingdom: a Survey of Household Resources and Standards of Living
(Data weighted by household type and SEG)

Based upon the above approach it is therefore possible to build predictive models of poverty and core poverty using variables included in the 1971 Census of Population. Tables 8 a and 8b (*below*) show the odds of poverty and core poverty respectively for a selection of variables included in both the 1968 survey and the 1971 Census.

Table 8a: Odds of Poverty in 1968 – Univariate Odds Ratios.

	exp(B)	se	Wald	Sig	% poor
No exclusive use of bath or shower	4.88	0.134	140.0	<.001	54.3
No exclusive use of indoor WC	3.76	0.139	91.3	<.001	50.0
Shares accommodation	1.89	0.159	16.1	<.001	36.9
Lacks access to a car	6.39	0.130	202.8	<.001	39.8
Lives in council accommodation	2.62	0.120	63.9	<.001	40.6
Lives in private rental accommodation	2.13	0.119	40.3	<.001	36.9
Head of household manual SEG	2.96	0.110	97.2	<.001	36.4
Overcrowded (1.5+ persons per room)	3.08	0.288	15.3	<.001	50.0
Single person household	1.77	0.197	8.4	<.01	36.4
Single pensioner household	5.08	0.155	110.5	<.001	57.7
Pensioner couple household	1.47	0.139	7.4	<.01	31.3
Lone parent household	1.71	0.665	0.7	ns	40.0

Source: Poverty in the United Kingdom: a Survey of Household Resources and Standards of Living
(Data weighted by household type and SEG)

Table 8b: Odds of Core Poverty in 1968 – Univariate Odds Ratios.

	exp(B)	se	Wald	Sig	% poor
No exclusive use of bath or shower	1.86	0.150	17.0	<.001	26.4
No exclusive use of indoor WC	1.50	0.162	6.2	<.05	23.3
Shares accommodation	1.08	0.194	0.1	ns	18.6
Lacks access to a car	3.55	0.136	87.1	<.001	26.1
Lives in council accommodation	1.38	0.140	5.2	<.05	21.6
Lives in private rental accommodation	2.38	0.131	44.3	<.001	28.9
Head of household manual SEG	2.87	0.125	71.1	<.001	26.5
Overcrowded (1.5+ persons per room)	2.33	0.307	7.6	<.01	32.0
Single person household	0.68	0.276	1.9	ns	13.2
Single pensioner household	3.42	0.160	59.1	<.001	38.3
Pensioner couple household	1.51	0.154	7.0	<.01	23.4
Lone parent household	2.64	0.665	2.1	ns	40.0

Source: Poverty in the United Kingdom: a Survey of Household Resources and Standards of Living
(Data weighted by household type and SEG)

These data consider the relationship between poverty and its predictors separately for each of the variables considered here. However, it is clearly important to consider their effects simultaneously since many of these variables are themselves inter-correlated. This can be achieved using multivariate binary logistic regression analysis where variable selection is based upon backward stepwise selection using the likelihood ratio method. Checking for multivariate outliers based upon examination of studentised residuals results in the deletion of a further 47 cases for each model leaving a total of 1,850 households available for analysis. Significant model coefficients are then entered in one block in a further logistic regression model and the results of these analyses are presented in Tables 9a and 9b (*below*).

Table 9a: Odds of Poverty in 1968 – Multivariate Odds Ratios.

	B	Exp(B)	se	Wald	Sig
No exclusive use of bath or shower	1.395	4.036	0.178	61.2	<.001
Lacks access to a car	1.994	7.346	0.188	112.9	<.001
Lives in council accommodation	0.642	1.901	0.177	13.2	<.001
Lives in private rental accommodation	1.130	3.097	0.171	43.8	<.001
Head of household manual SEG	0.507	1.660	0.144	12.3	<.001
Overcrowded (1.5+ persons per room)	0.754	2.125	0.357	4.5	<.05
Single pensioner household	1.128	3.089	0.186	36.7	<.001
Pensioner couple household	0.460	1.584	0.175	6.9	<.01
Constant	-3.931	0.020	0.196	401.2	<.001
Model Chi Square (df)					*582 (8)*
Nagelkerke R Square					*0.411*
% correctly classified: overall					*80.8*
% correctly classified: poor					*43.1*

Source: Poverty in the United Kingdom: a Survey of Household Resources and Standards of Living
(Data weighted by household type and SEG)

Table 9b: Odds of Core Poverty in 1968 – Multivariate Odds Ratios.

	B	Exp(B)	se	Wald	Sig
No exclusive use of bath or shower	0.433	1.541	0.174	6.2	<.05
Lacks access to a car	0.890	2.435	0.162	30.3	<.001
Lives in private rental accommodation	0.687	1.988	0.157	19.1	<.001
Head of household manual SEG	0.664	1.942	0.145	21.0	<.001
Single pensioner household	0.938	2.554	0.182	26.5	<.001
Pensioner couple household	0.421	1.524	0.173	5.9	<.05
Constant	-2.968	0.051	0.148	403.9	<.001
Model Chi Square (df)					*202 (6)*
Nagelkerke R Square					*0.173*
% correctly classified: overall					*82.9*
% correctly classified: poor					*7.0*

Source: Poverty in the United Kingdom: a Survey of Household Resources and Standards of Living
(Data weighted by household type and SEG)

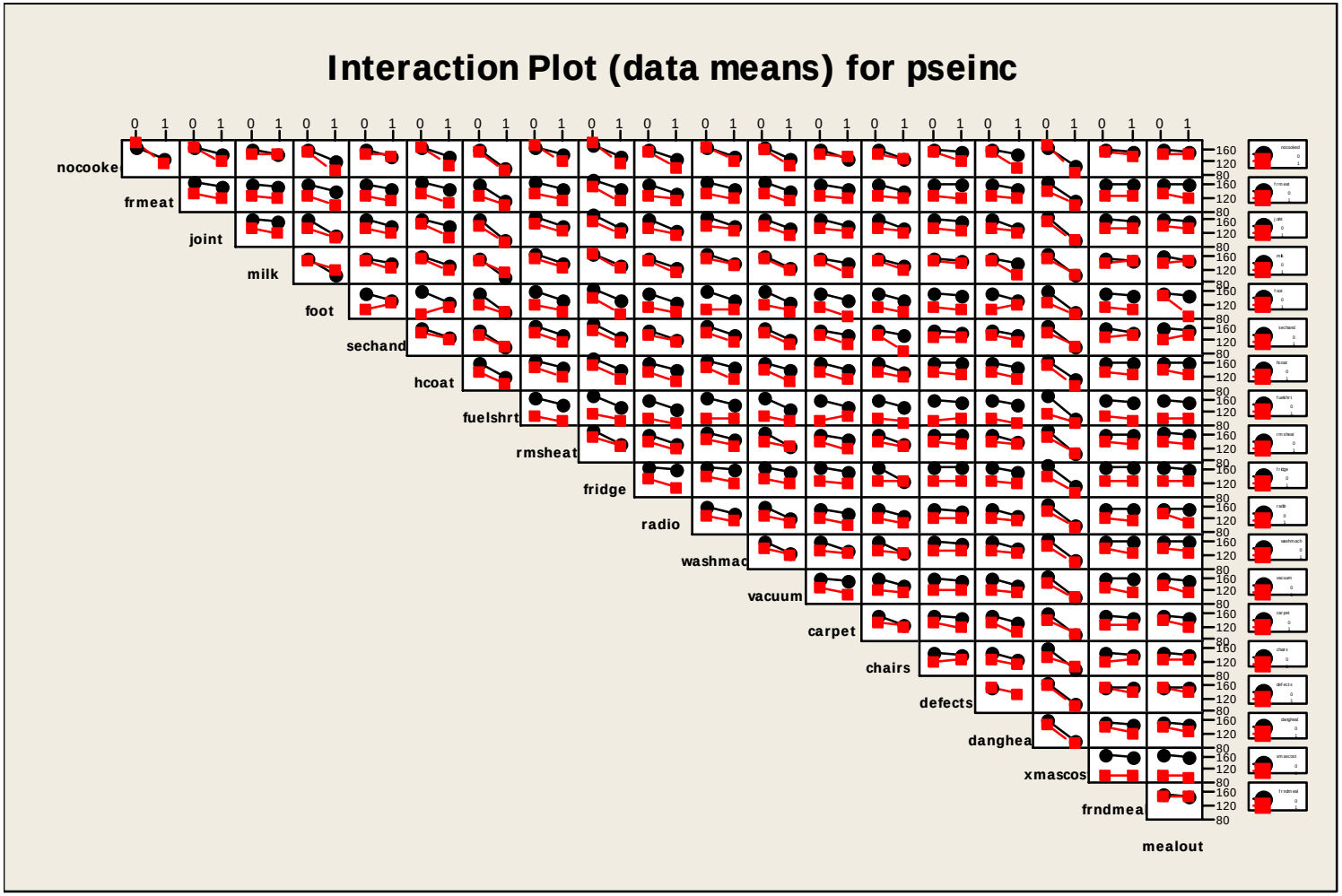
The reflated weightings derived from the logistic regression parameter coefficients presented in Table 9a (*above*) mean that for households living in Great Britain in 1968-69 (and weighted to the population distribution of the 1971 Census), the total number of households classified as living in poverty are:

'Poverty' weightings, 1968-69
17% of households lacking exclusive use of bath or shower +
25% of households lacking access to a car +
8% of households living in council accommodation +
14% of households living in private rental accommodation +
6% of households headed by a manual worker +
9% of overcrowded households +
14% of single pensioner households +
6% of pensioner couple households.

Similarly, the reflated weightings derived from the logistic regression parameter coefficients presented in Table 9b (*above*) mean that for households living in Great Britain in 1968-69 (and weighted to the population distribution of the 1971 Census), the total number of households classified as living in 'core poverty' is:

'Core Poverty' weightings, 1968-69
7% of households lacking exclusive use of bath or shower +
14% of households lacking access to a car +
11% of households living in private rental accommodation +
11% of households headed by a manual worker +
15% of single pensioner households +
7% of pensioner couple households.

Appendix 1: Interaction Plots of All Reliable Items Against PSE Equivilised Income



Appendix 2

Title: **Poverty in the United Kingdom: A Survey of Household Resources and Standards of Living, 1967-1969 (SN 1671)**

Principal Investigator(s):
Townsend, P.,University of Essex. Department of Sociology
Abel-Smith, B.,University of Essex. Department of Sociology

Sponsor(s):
Joseph Rowntree Memorial Trust

Abstract:
This study aimed to collect comprehensive information on all forms of resources (including income and assets) and indicative information on deprivation and style of living in order to define and measure poverty among a representative sample of the population of the United Kingdom.

This major study was the result of fifteen years research. In 1964 the Joseph Rowntree Memorial Trust agreed to finance pilot studies on fatherless families, large families and unemployed and disabled people which were then to be followed by a national survey of poverty. In 1967-68, following pilot work, interviews were completed with 2,052 households (6,045 people), in 630 parliamentary constituencies throughout the United Kingdom. Another 1,514 households (3,539 people), were later interviewed in a poor area of Ireland, Scotland, England and Wales to secure information about the populations of the poorest areas.

There were mixed reactions to the book's publication in 1979. The concept of relative deprivation provoked much discussion but the issue of multiple deprivation experienced by individuals and families was largely ignored. Comparatively little attention was paid to certain forms of deprivation - such as deprivation at work and environmental or locational deprivation - although the report gave data about multiple deprivation drawn from 60 indicators.

Main Topics:
(i) Housing and living facilities: exact composition of household; adequacy of basic facilities; degree of overcrowding; deficiency of bedrooms; overall household facilities; degree of satisfaction with facilities and environment.
(ii) Employment: 'work record' of each individual over previous twelve months; educational background.
(iii) Occupational facilities and fringe benefits: type of facilities provided for indoor and outside employment; eligibility for fringe benefits (e.g. sick pay, occupational pension); value of fringe benefits in kind received during the year (e.g. meal vouchers, subsidised meals, use of vehicles).
(iv) Current Monetary Income: information on total cash income in (a) previous week, (b) previous twelve months, from any source of each income unit in the household. Questions on earnings, income of self- employed, government social security benefits, and miscellaneous sources of income. Also questions on housing costs and house value.

(v) Savings and assets: information on the value of savings and assets owned by the household, including housing and household or personal possessions.
(vi) Health and disability: general assessment of health of household members; details of any illnesses or disabilities; capacity to undertake ordinary personal and household activities;
(vii) Social services: utilisation of services including periods in hopital and visits to doctors and dentists. Information on welfare benefits received e.g. free school meals, educational maintenance allowances.
(viii) Income in kind: questions on goods and services received in the previous twelve months from relatives and friends.
(ix) Style of living: leisure time activities including holidays; questions on diet, clothing and fuel supply; assessment of own financial situation; arrangements for payment of housekeeping and bills; whether manage to have savings; feelings about 'poverty'.

In addition to the questionnaire and data codebook, the documentation for this study also includes qualitative information of various kinds about the original survey, including interviewers' documents, sampling information, survey documents (including meeting notes), reports and papers. These items were originally held separately by Qualidata, and have been added to the study during 2002 to enhance the available documentation.

Coverage:
Dates of Fieldwork: 1967-1969
Country: United Kingdom
Spatial Units: Electoral Wards/Divisions (UK); Populations of poorest areas
Observation Units: Individuals; Families/households
Kind of Data: Textual data; Alpha/numeric data; Individual (micro) level; Interviewers briefing notes; Progress reports; Correspondence and minutes from meetings.

Universe Sampled:
Location of Units of Observation: National
Population: Households in the United Kingdom

Methodology:
Time Dimensions: Cross-sectional (one-time) study
Sampling Procedures: Multi-stage stratified random sample. In addition to the national sample, interviews were conducted in four special areas in Belfast, Neath, Glasgow and Salford. These areas, chosen from among the constituencies already included in the sample, were selected using criteria indicating that the incidence of the main types of low-income households would be well above the national average
Number of Units: 2052 (obtained) Main sample: households; 6098 (obtained) Main sample: individuals; 1208 (obtained) Poor areas: households; 3950 (obtained) Poor areas: individuals
Method of Data Collection: Face-to-face interview