

Reduced scales for measuring deprivation: evidence for the UK and Scotland from the PSE-UK survey

PSE-UK Working Paper

Nick Bailey - August 2015

Abstract

The aim of this paper is to explore whether it is possible to measure deprivation more efficiently using a reduced scale or subset of items from the main PSE scale. The general motivation is that many surveys which are not primarily concerned with poverty or deprivation might nevertheless like to include a deprivation measure but they struggle to accommodate the lengthy scales such as those produced by the PSE-UK study. A more immediate motivation was a request from the Scottish Government for a recommendation for a reduced scale to be included in the *Scottish Household Survey*. A reduced scale was already being employed in the *Family Resources Survey*, as part of the UK government's child poverty measure (McKay 2011). The analysis is therefore conducted for the whole of the UK and for Scotland. It examines both the adult and the children's scales.

Different approaches to devising the reduced scales could be taken. The approach here is to find the subset of items from the full PSE scales which best enables us to identify adults or children regarded as poor on the full scales. The full PSE scales result from an extensive exercise to develop measures based on popular opinion about the 'necessities of life' which also meets several scientific criteria (reliability, validity and additivity). Taking this measure as the 'best' estimate of deprivation, the paper tries to identify reduced scales which give as close an approximation as possible to the full scale. It is an approach based on emphasising internal validity rather than other criteria such as reliability. Comparisons of the reduced scales (11 items each for adults and children) show that they correlate very highly with the full scales and that they can very accurately identify individuals regarded as deprived at different points on the full scale – at least down to the level of the most deprived 15 per cent.

Analysis of the role played by the individual deprivation items within the overall index highlights the importance of the 'ordering' of these items. Some are much more commonly lacked than others. People who lack the 'rarely lacked' items almost always lack the 'commonly lacked' items as well. Conversely, people who have 'commonly lacked' items are very unlikely to be without 'rarely lacked' items. This work could therefore be used to develop a responsive measure – one where the number of questions asked depends on the respondent's answers to initial questions. Although not tested here, this has the potential to achieve even closer correlations with the full scale but with significantly greater efficiency.

In addition, the analyses conducted in this paper suggest that those developing future scales need to pay greater attention to the ordering of items and their 'severity' to achieve measures which are appropriate to identifying deprivation at the intended levels.

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Reduced scales for measuring deprivation: evidence for the UK and Scotland from the PSE-UK survey

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1. Introduction

The purpose of this Working Paper is to develop a reduced set of items from the PSE survey which can be used to measure deprivation, along the lines of the set included in the *Family Resources Survey* (FRS) to capture child poverty. The Scottish Government (SG) has asked us to recommend a set of items to be included in the *Scottish Household Survey* (SHS). This would enable estimates of deprivation to be made down to the level of individual local authorities. Others may also appreciate having a shorter set of items for inclusion in surveys with a broader focus than just poverty. We examine what a reduced scale would look like for the UK and for Scotland. We look at a measure of about the same size as the FRS one, i.e. around 21 items or about half the length of the current PSE scale (46 items for adults and children together).¹ We also look at the possibility of even shorter scales although we do not, in the end, recommend these.

In the process, we compare our results with the existing FRS deprivation scale and conduct some tests on that scale. The result is a number of comments on the construction of that key child poverty measure.² The scale included in the FRS was designed in the context of debates about child poverty but combines measures of adult or household deprivation and measures of child deprivation. It does this for two reasons. First, many children in deprived households are not themselves deprived due to the efforts of adults to shelter them from the effects of low income. The pressures of low income on the family therefore show up in adult indicators but not in child indicators. Policy makers and researchers are presumably concerned about all families in poverty, not just those where the children are measured as being deprived so the measure needs to capture both. Second, it is helpful to measure deprivation on items which are applicable to all adults or households so that the relative position of different kinds of households can be assessed. The SG wanted a similar all-purpose measure and that is the approach taken here.

The development of the FRS deprivation measure

The FRS material deprivation scale is an extremely important measure. The FRS scale was used to determine the number of children in the UK materially deprived under the definitions of the Child Poverty Act 2010. In conjunction with a low income cut-off (below 70 per cent of contemporary median household income, Before Housing Costs), this measure is the basis for judging the Government's performance on one of the four statutory targets set by the Child Poverty Act 2010 (DWP 2013). The DWP claims of the FRS set of items that: "Together, these questions form the best discriminator between those families that are deprived and those that are not." (DWP 2013, p269). In relation to the revised set, they claim

1 At the time the analytical work was undertaken for this paper, 46 items had been identified as meeting the initial criteria for inclusion in the PSE scale. Subsequent analysis led to the removal of two items from the children's scale (indoor games suitable for their ages and construction toys such as lego) after completion of testing for reliability, validity and additivity (see Gordon 2014).

2 The Conservative Government has announced proposals for change the official child poverty measure but has committed to continue collecting data for the existing measure through the FRS.

that: "The new series more accurately reflects today's society and the items and activities people in the UK believe to be necessary" (p285).

The FRS deprivation measure was introduced in 2004/5 and updated in 2010/11 following a report for the DWP by McKay (2011). The original set of 21 items was based on work by McKay and Collard (2004) which drew on data from the PSE 1999 as well as other sources including the *British Household Panel Survey* and the *Family and Children Study*. For the revisions, McKay (2011) drew on the results of a specially commissioned survey. His report recommended dropping four of the original items, and introducing four new ones. The 2010/11 FRS survey included all the original measures and the new ones to allow a continuous series to be produced. The 2011/12 FRS survey and subsequent ones have only the revised set of 21 (DWP 2012, 2013).

There is a case for simply adopting the revised FRS measure in surveys such as the SHS, particularly given the fact that it was updated so recently. This would enable statistics to be produced which were directly comparable with Scottish and UK data. There are two reasons why an alternative measure is preferable. First, McKay's (2011) report on the updating of the FRS measure was based on the results of a relatively small survey on attitudes to necessities items and on the prevalence of these items among families (960 household with 220 in families with children). The survey was conducted in 2009. The PSE data provides information on the same topics but is both more recent (2012) and much larger in scale: the survey on attitudes to necessities covers 2000 people while the main survey which provides data on the prevalence of items had 5200 households of which 1700 have children, and covered 9000 adults. The PSE surveys can therefore provide a more up-to-date and reliable source on which to base a new measure.

Second, the PSE data is sufficiently large to permit analysis of results for Scotland separately on views about necessities and on the prevalence of items. On views about necessities, Gannon and Bailey (2014) have shown that views in Scotland differ remarkably little from those in the UK as a whole. We therefore work solely from the UK data on these perceptions; we do not attempt to develop a new starting set of necessities items for Scotland but base the analysis on the set of items identified in UK analyses. On prevalence, there are more variations. The main survey Scottish sample has 1250 households with 2200 adults. Of these, 330 are households with children. We use this data to explore whether the Scottish data leads to a different reduced set for Scotland.

Table 1.1 shows all the items in the original or revised FRS measures and indicates which are included in the PSE 2012 set of necessities. Figure 1.1 shows the level of public support for each item in McKay's survey and the level in the PSE survey; it includes three of the four items which McKay recommended dropping – marked 'OUT'³. It should be noted that some items are not directly comparable and that may explain some variations (e.g. with savings⁴). Overall, there is some evidence that, in the PSE survey, people were slightly more inclined to view items as necessities overall.

3 The PSE survey did not ask about the fourth – children swimming. See below for explanation.

4 On savings, for example, McKay asked about 'enough money to save £10 per month' whereas the PSE put the amount at £20 per month and that may be part of the reason why support is that much lower in the PSE survey.

Table 1.1 shows there are substantial overlaps between the FRS scale and the full PSE scale but also significant differences. One way of comparing the measures is to ask whether the same decisions would have been taken over changes to the FRS measure on the basis of the data available from the PSE survey. McKay (2011) recommended dropping items largely on the basis that they no longer had majority support as necessities although he took a less rigid approach to the 50 per cent threshold than the PSE, prioritising consistency over time as well. He also took account of feedback from qualitative research and, when selecting replacement items, he sought to ensure a balance of items across different domains. (The discussion below raises doubts about the use of the latter as a criterion.)

With the adult items, there are significant disagreements. McKay recommended retaining eight of the original 11 but the PSE survey suggests that a further three of these eight now lack popular support: furniture, money for self and holiday. McKay also found that the last of these did not have majority support but argued for retention on the grounds that it played such a strong role in the overall measure as so many people lacked this item; dropping it would have disrupted comparisons over time. (The analysis here suggests this was probably the right decision but for other reasons – see Section 5. below.) He recommended dropping three adult items on grounds of low public support. The PSE survey supports dropping only one of these (friends round for meal once a month) but suggests that the other two retain majority support (shoes and hobby). McKay's one addition – keeping up with bills – was not tested for inclusion as a necessity in the PSE survey.

One issue which this comparison highlights is that relying on a single survey of public opinion and using the hard 50 per cent cut-off can lead to a rather unstable set of indicators. Overall, this should not matter too much: as all the indicators correlate highly, the substitution of one for another makes little difference to the measure as a whole. At the margins, however, it may make a significant difference particularly where there is a high proportion of people who lack a particular item. McKay is recognising this when he argues for the retention of holiday on the basis that dropping it would be too disruptive. The PSE approach has always been to stick rigidly to the 50 per cent threshold, to emphasise the democratic legitimacy of the measure. The earliest versions of the deprivation measure developed by Townsend (1979) were strongly criticised for the subjective basis for selecting indicators (Piachaud 1981). Mack and Lansley's (1983) solution was to use a democratic norm (majority support) and this has been kept ever since. Using the latest data on popular views has the advantage that the measure is more sensitive to changing opinions (reflecting the recession, for example) but the disadvantage that it is more subject to noise, at the margins. There are other areas where a degree of subjective 'expert' judgement is involved in the construction of the measure, however, so there is not an absolute argument against a more flexible operation of the 50 per cent cut off.

With child items, there is more agreement between the FRS and PSE data. McKay recommended retaining nine of the original set of ten items. The PSE survey supports the retention of eight of these but drops 'friends round for meal once a fortnight' (though only just). One child item is dropped by McKay (swimming) on grounds of low public support. This item was not tested by the PSE since previous surveys had shown that far more children lacked the item because they did not want it than lacked it due to affordability, so there is agreement here. McKay recommends including three new items and all these are also included in the PSE measure.

Table 1.1: Material deprivation items in the FRS

FRS item	Original measure	Dropped or added from 2010/11	PSE necessity
Adults/household			
Keep home in decent state of decor	Yes		Yes
Replace worn out furniture	Yes		No
Replace/repair broken elec. goods	Yes		Yes
Money to spend on self each week	Yes		No
Two pairs of all-weather shoes	Yes	OUT	Yes
Regular savings of £20 a month	Yes		Yes
Household contents insurance	Yes		Yes
Keep home adequately warm	Yes		Yes
Able to keep up with bills		IN	Not tested ¹
Hobby or leisure activity	Yes	OUT	Yes
Holiday one week a year	Yes		No
Family round for meal once a month	Yes	OUT	No
Children			
Fresh fruit/vegetables once a day		IN	Yes
Bedrm for every child 10+ of diff sex	Yes		Yes
A warm winter coat		IN	Yes
Garden or outdoor space	Yes		Yes
Leisure equipment e.g. sports, bicycle	Yes		Yes
Hobby or leisure activity	Yes		Yes
Celebrations on special occasions	Yes		Yes
Friends round once a fortnight	Yes		No
Holiday away from home once a yr	Yes		Yes
Toddler/nursery grp once a week	Yes		Yes
School trip once a term	Yes		Yes
Activities e.g. drama, football etc.		IN	Yes
Swimming once a month	Yes	OUT	Not tested

Source: DWP (2013) *HBAI*, p.276.

Notes: 1. A question on this topic is included in PSE main survey (five response categories) but it was not tested as possible necessity.

Figure 1.1: Public support for items – McKay survey for FRS vs PSE survey

Approach to constructing reduced scales

The full PSE measure has been built on a clear theoretical and methodological foundation, refined over successive waves. In the latest 2012 survey as in previous ones, items have been identified as possible necessities following a detailed literature review, expert consultations and qualitative research, and they are intended to give a balanced set, covering a range of domains or aspects of consumption and of social life. Items were accepted as necessities in the final measure only where they had majority public support. In addition, they had to pass a series of statistical tests of reliability, validity and additivity (Gordon 2014). For reliability, each item had to contribute to the reliability of the scale as a whole, and it had to be shown to effectively discriminate between poor and non-poor groups on its own. For validity, each item had to have a positive relationship with other measures of poverty (subjective poverty, low income) or with variables associated with poverty (poor health). For additivity, exhaustive tests were used to ensure that people who lack any two items were poorer on these same indicators than those who lacked just one of the pair. From a long list of items, all the items which met the relevant criteria have been retained.⁵ This same methodology has been applied on other occasions, including being used for the development of a material deprivation scale for the whole of Europe (Guio et al 2012).

In this paper, we have a different task and a different approach. We are starting with a set of indicators which have been shown to work together to provide an effective measure of deprivation. In devising a reduced scale, the approach has been taken to select from within this set those items which enable us to best capture the overall measure. This is purely an empirical exercise. The test of any potential reduced set is the extent to which it identifies the same group of people as ‘poor’ as the full measure – internal validity. We use different approaches to try to identify this set, although they are all variations on the same theme. Unlike McKay (2011), we do not pay any attention to the coverage of different domains although we do examine and comment on the coverage when looking at the recommended reduced set at the end.

The process is as follows:

- a. The aim is to develop two reduced scales, one to identify ‘poor adults’ and a second to identify ‘poor children’. We start by developing scales which effectively identify adults lacking three or more necessities and children lacking 2 or more necessities. We go on to explore whether reduced scales to identify more extreme levels of deprivation would have a different composition.
- b. We assume that we are constructing a standalone measure with about the same number of items as the current FRS deprivation scale. We also discuss the possibility of an even shorter measure.
- c. We use UK views about which items should be regarded as necessities (Gannon and Bailey 2014) and we ignore items which were rejected from the UK measure on the

⁵ As noted above, this paper was written before completion of the review of the deprivation scale and therefore starts with two additional items.

- grounds of the tests of reliability, validity or additivity (Gordon et al 2013; Main and Bradshaw 2013). This gives us the starting set of 22 adult and 24 child necessities items.
- d. To identify possible reduced sets, we use a variety of approaches, two suggested by McKay (2011) and a two others but all variations of a similar idea:
 1. Ordering items by *prevalence* (proportions of the whole population lacking each item through affordability) and testing how well the most prevalent items identify the people regarded as poor on the full set;
 2. Ordering items by the *proportion of poor people who lack that item* through affordability and testing as in 1;
 3. Ordering items by *severity* (the average level of deprivation for people who lack that item) and testing as in 1;
 4. *Backwards selection* – starting with the full set of items and progressively removing the item which makes least difference to the ability of the measure to capture the poor. We look first at adult items and then at child items. We examine how well the different reduced sets of items capture both the UK poor and the Scottish poor and we test this using different thresholds of deprivation.
 - e. We compare the different measures and reach an overall judgement.
 - f. We then look at how the reduced sets compare with the FRS set to see whether diverging from that set is justified.

In the analyses which follow, we use the appropriate weights (for UK or Scottish analyses). We exclude cases altogether where there are missing values for more than five of the relevant necessities items so that the set of people included in the analysis remains more or less fixed; i.e. it does not vary as items are included or dropped. It also prevents people with large numbers of missing responses being counted in the non-poor group.

For the Scottish Government, we did also consider the extent to which we could use questions already included within the SHS as part of the deprivation measure. Our conclusion was that we could not – see Appendix 1 for detailed discussion.

2. Reduced scale for adults

We begin by using the main threshold of lacking three or more items to identify ‘poor adults’ and we try to develop reduced scales which can identify this groups as effectively as possible.

Prevalence-based measures

There is a very high degree of similarity between the prevalence of adults lacking necessities items through affordability in Scotland and in the UK as a whole although there are also some significant differences for particular items (Table 2.1 and Figure 2.1). The largest difference is with dental work where just 7 per cent of Scots report being unable to afford this, compared with 17 per cent for the UK as a whole; other analysis shows that there is a correspondingly higher proportion of Scots who say they do not want recommended treatment. In general, the proportions lacking items through affordability are slightly lower in Scotland than in the UK as a whole.

Figure 2.1 also shows that Scotland has slightly less poverty overall than the rest of the UK. This finding is replicated in other datasets (including the FRS). This is somewhat surprising given Scotland’s reputation for being a poorer region but there appears to have been a significant break around 10 years ago (Bailey 2014).

Table 2.1: Prevalence - percent “lacking/don’t do, unable to afford” each item – UK and Scotland

Order	Item	UK	Scotland
1	Could household afford unexpected, but necessary, expense of £500	34%	33%
2	Regular savings (of at least £20) for rainy days	31%	28%
3	Regular payments into an occupational or private pension	27%	23%
4	Enough money to replace/repair broken electrical goods	26%	23%
5	Enough money to keep home in a decent state of decoration	19%	15%
6	All recommended dental work/treatment	17%	7%
7	Home Insurance	12%	8%
8	Damp-free home	12%	7%
9	Taking part in sport/exercise activities or classes	10%	9%
10	A hobby or leisure activity.	8%	7%
11	Appropriate clothes for job interviews	8%	7%
12	Two pairs of all weather shoes	7%	6%
13	Heating to keep home adequately warm	7%	6%
14	Fresh fruit and vegetables everyday	6%	5%
15	Table and chairs at which all the family can eat	5%	5%
16	Meat, fish or vegetarian equivalent every other day	4%	4%
17	A warm waterproof coat	4%	3%
18	Celebrations on special occasions, such as Christmas	3%	2%
19	Visiting friends or family in hospital or other institutions	3%	2%
20	Attending weddings, funerals and other such occasions	3%	2%
21	Two meals a day	2%	2%
22	Curtains or window blinds	1%	1%

Notes: Weighted data – around 7700 cases for UK and 1800 for Scotland (numbers vary between questions). Other responses (have/do; don’t have/do, don’t want; and unallocated) all treated as the contrast.

Figure 2.1: Prevalence of adult items – UK and Scotland

Following McKay’s approach, we examine the proportion of the ‘poor’ (lacking 3 or more necessities) who would be captured by a measure using the top n items from the previous table (where n runs from 3 to 12). We do this in three ways: using a UK-based measure to assess the proportion of the UK poor captured; using the same UK-based measure to assess the proportion of the Scottish poor captured; and using a Scottish-based measure to assess the proportion of the Scottish poor captured (i.e. ordering items by prevalence in Scotland). Results are shown in Table 2.2 and Figure 2.2.

The three measures perform in a very similar manner and, when trying to capture the Scottish poor, there is very little to choose between the UK-based and Scottish-based measures although the former performs slightly better with fewer items. With six items, we can capture 86 per cent of the Scots poor using the UK-based measure. With 11 items, we can capture 96

per cent of the Scots poor using either measure. Beyond 11 items, there are quite modest further gains.

Table 2.2: Percent of UK and Scottish poor captured by prevalence-based measures

Number of items in measure	% of poor (3+ deprivations) captured by measure:		
	UK defn, UK poor	UK defn, Scot poor	Scot defn, Scot poor
3	38%	45%	59%
4	68%	76%	76%
5	76%	81%	81%
6	81%	86%	83%
7	84%	87%	85%
8	90%	88%	90%
9	92%	91%	91%
10	94%	94%	94%
11	95%	96%	96%
12	96%	97%	97%

Figure 2.2: Prevalence-based measures – UK and Scotland

Proportions-based measures

A second approach is to look the proportion of the poor who lack each item i.e. the prevalence of lacking due to affordability amongst the poor rather than the whole population as in the previous approach. Again, there is a high level of agreement between UK and Scottish samples on the ordering of items (Table 2.3, Figure 2.3). Dental work is again the item where there is greatest difference; far fewer poor people in Scotland lack access to recommended dental work because they cannot afford it than in the UK as a whole. The proportion of the poor lacking items is more similar between Scotland and the UK as a whole.

Table 2.3: Proportion of poor lacking each item – UK and Scotland

Order	Item	UK	Scot
1	Could household afford unexpected, but necessary, expense of £500	79%	87%
2	Regular savings (of at least £20) for rainy days	74%	79%
3	Enough money to replace/repair broken electrical goods	71%	77%
4	Regular payments into an occupational or private pension	60%	63%
5	Enough money to keep home in a decent state of decoration	53%	51%
6	Home Insurance	33%	27%
7	Taking part in sport/exercise activities or classes	28%	26%
8	Appropriate clothes for job interviews	21%	24%
9	All recommended dental work/treatment	41%	23%
10	A hobby or leisure activity.	23%	21%
11	Heating to keep home adequately warm	19%	20%
12	Damp-free home	28%	20%
13	Two pairs of all weather shoes	21%	20%
14	Fresh fruit and vegetables everyday	17%	18%
15	Table and chairs at which all the family can eat	12%	17%
16	Meat, fish or vegetarian equivalent every other day	12%	13%
17	A warm waterproof coat	11%	11%
18	Attending weddings, funerals and other such occasions	8%	7%
19	Two meals a day	6%	6%
20	Visiting friends or family in hospital or other institutions	7%	5%
21	Celebrations on special occasions, such as Christmas	9%	5%
22	Curtains or window blinds	3%	2%

Figure 2.3: Proportion of poor lacking each item – UK and Scotland

As previously, we use the rankings for UK and Scotland to create two sets of measures with gradually increasing numbers of items. We show in Table 2.4 and Figure 2.4 the proportions of the poor in the UK and Scotland captured by each. These measures again perform in a very similar manner to each other, converging in the later stages, although again the UK-based measure has a slight edge. With six items, we capture 86 per cent of the Scots poor using the UK-based measure. With eleven items, we capture 96 per cent. Beyond this point, further additions produce diminishing returns.

Table 2.4: Percent of poor captured by proportions-based measures

Number of items in measure	% of poor (3+ deprivations) captured by measure		
	UK defn, UK poor	UK defn, Scot poor	Scot defn, Scot poor
3	50%	59%	59%
4	67%	76%	76%
5	76%	81%	81%
6	81%	86%	83%
7	84%	87%	85%
8	88%	90%	88%
9	92%	91%	91%
10	94%	94%	94%
11	95%	96%	95%
12	96%	97%	97%

Figure 2.4: Percent of poor captured by proportions-based measures

Severity-based measures

A third approach is to focus on ‘severity’. The ‘severity’ of an item can be interpreted as the likely level of deprivation suffered by individuals who lacks that item through affordability; it is measured in units of standard deviation from the average (see Gordon et al 2013 for details). Severity tests indicate that some items (e.g. visiting friends or family in hospital etc.) only tend to be lacked by people with very high levels of deprivation (Table 2.5). These people are likely to also lack the items with lower severity (e.g. unable to afford an unexpected bill of £500) but the opposite does not usually apply. In our reduced scale, it makes more sense to focus on items at the bottom of the severity scale since we are building a measure to identify all those lacking 3 or more items, rather than the most deprived.

There is some overlap in the items at the top of the list with the prevalence and proportion scales but also significant variation. The items in the top 10 on the severity list include all five items with the highest prevalence and seven of the top 10, but it also includes three items from outside the prevalence top 10.

Table 2.5: Severity of items – UK only

Order	Item	Severity
1	Could household afford unexpected, but necessary, expense of £500?	0.5
2	Regular savings (of at least £20) for rainy days	0.6
3	Enough money to replace or repair broken electrical goods	0.7
4	Regular payments into an occupational or private pension	0.9
5	Enough money to keep home in a decent state of decoration	1.0
6	All recommended dental work/treatment	1.4
7	Home Insurance	1.5
8	Taking part in sport/exercise activities or classes	1.7
9	Appropriate clothes for job interviews	1.7
10	Two pairs of all weather shoes	1.7
11	A hobby or leisure activity.	1.8
12	Fresh fruit and vegetables everyday	1.8
13	Heating to keep home adequately warm	1.9
14	Meat, fish or vegetarian equivalent every other day	2.0
15	Damp-free home	2.1
16	A warm waterproof coat	2.1
17	Celebrations on special occasions, such as Christmas	2.2
18	Two meals a day	2.3
19	Attending weddings, funerals and other such occasions	2.4
20	Table and chairs at which all the family can eat	2.4
21	Curtains or window blinds	2.8
22	Visiting friends or family in hospital or other institutions	3.0

Note: Severity figures from Gordon et al (2013).

Table 2.6 and Figure 2.5 show the results of this approach. As with previous measure, the reduced sets are very good at capturing both UK and Scots poor. Here the Scots-based measure is slightly better but does not perform as well as the previous two. Eleven items capture 93 per cent of the poor, beyond which returns appear to drop. For shorter scales, six items captures 86 per cent of the Scots poor.

Table 2.6: Severity-based measure – UK and Scottish poor

Number of items in measure	% of poor (3+ deprivations) captured by measure	
	UK defn, UK poor	UK defn, Scot poor
3	50%	59%
4	67%	76%
5	76%	81%
6	81%	86%
7	84%	87%
8	86%	88%
9	89%	91%
10	90%	93%
11	91%	93%
12	92%	96%

Figure 2.5: Severity-based measures

Backward selection

The final approach is to start from the full set of 22 items and to remove items one at a time, taking out the item which makes least difference to the number of people identified as poor in the remaining set. The results for the UK are shown in Table 2.7. For example, with the full set of 22 items, 'curtains' is the least useful item. If we drop this and make a measure with the remaining 21 items, there are only 2 PSE poor individuals not picked up; i.e. there are only two people who lack exactly three necessities, one of which is 'curtains'. With 11 items, we can pick up 95 per cent of the UK poor adults identified by the full measure and 96 per cent of the Scots poor adults; 6 items capture 81 and 86 per cent respectively.

We can repeat the exercise using Scottish data to determine the selection of items (Table 2.8 and Figure 2.8). The Figure also includes the result of using the UK-based measure on the Scots poor for comparison. The results are very close across the spectrum and practically identical at the key thresholds of 6 and 11 items.

Table 2.7: Backwards selection of items – UK-based

Items in measure	Item to be dropped	UK-based, UK poor	UK-based, Scots poor
22	curtainshh	100%	100%
21	twomeal	100%	100%
20	wedding	100%	100%
19	celebrat	100%	100%
18	vegfruit	99%	100%
17	warmcoat	99%	99%
16	meatfish	99%	99%
15	shoes	98%	99%
14	hospital	98%	98%
13	tablechhh	97%	97%
12	heating	96%	97%
11	jobfrock	95%	96%
10	hobby	94%	94%
9	insurancehh	92%	91%
8	sportex	90%	89%
7	nodamphh	87%	86%
6	dental	81%	86%
5	decorate	76%	81%
4	pension	68%	76%
3		50%	59%

Note: the three items included in the last measure are: expenses, savings and electrical goods.

Figure 2.6: Backwards selection of items – UK-based**Table 2.8: Backwards selection of items – Scots-based**

Items in measure	Item dropped	Scots-based, Scots poor
22	curtainshh	100%
21	twomeal	100%
20	meatfish	100%
19	wedding	100%
18	celebrat	100%
17	vegfruit	100%
16	tablechhh	99%
15	warmcoat	99%
14	heating	99%
13	hospital	98%
12	shoes	97%
11	insurancehh	96%
10	jobfrock	94%
9	nodamphh	92%

8	hobby	90%
7	sportex	87%
6	decorate	86%
5	dental	81%
4	pension	76%
3		59%

Note: the three items included in the last measure are: expenses, savings and electrical goods.

Figure 2.8: Backwards selection – Scots-based and UK-based

Lacking items by level of deprivation

Figure 2.9 shows the distribution of people who lack each item in terms of their level of deprivation across all 22 items (UK data). The items are sorted left-to-right in descending order of prevalence. As we would expect, the items which are more commonly lacked such as ‘expenses’ or ‘savings’ also tend to be lacked by people with lower levels of deprivation. With items lacked by relatively few people, they only tend to be lacked by people with high levels of deprivation. This relationship can also be seen in the ordering of items in the backwards selection process. We can plot the ordering by prevalence to show the relationship (Figure 2.10). The items which are lacked by few people contribute very little to the identification of people lacking 3+ items. They are obviously important in assessing higher levels of deprivation but, at the lower level, they can be omitted from the measure with very little loss of information.

Figure 2.9: Distribution of adults lacking each item by level of deprivation – UK

Lacking		100%	34%	31%	27%	26%	19%	17%	12%	12%	10%	8%	8%
Order			1	2	4	3	5	6	9	7	8	10	11
Adult depvn score		All case	expensesh	savings	pension	elec	decorate	dental	InsuranceH	nodampHH	sportex	hobby	jobfrock
	0		42%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1		15%	13%	8%	12%	2%	3%	8%	3%	10%	3%	1%	2%
2		9%	9%	11%	12%	6%	4%	8%	4%	10%	6%	2%	4%
3		7%	10%	11%	11%	9%	8%	8%	6%	12%	7%	7%	4%
4		6%	12%	12%	11%	12%	10%	10%	8%	8%	7%	9%	2%
5		4%	10%	10%	8%	12%	11%	10%	10%	9%	8%	6%	7%
6		4%	9%	10%	9%	12%	12%	10%	8%	9%	7%	7%	8%
7		3%	8%	8%	8%	10%	10%	11%	12%	9%	9%	8%	9%
8		3%	7%	7%	7%	9%	9%	8%	10%	8%	11%	10%	8%
9		2%	6%	7%	6%	9%	9%	7%	11%	6%	10%	11%	15%
10		1%	4%	4%	5%	5%	6%	5%	6%	4%	8%	8%	10%
11		1%	3%	3%	3%	4%	5%	4%	5%	4%	6%	6%	6%
12 12+		3%	8%	8%	8%	10%	13%	11%	17%	11%	17%	24%	25%
Total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

		Lacking	7%	7%	6%	5%	4%	4%	3%	3%	3%	2%	1%	
		Order	15	12	18	13	16	17	19	14	20	21	22	
Adult depvn score		shoes	heating	vegfruit	tablechHH	meatfish	warmcoat	celebrat	hospital	wedding	twomeal	CurtainsH		
	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	1	1%	2%	0%	3%	1%	1%	2%	12%	1%	1%	1%	1%	
	2	2%	4%	3%	7%	1%	2%	1%	8%	3%	1%	2%	2%	
	3	1%	5%	2%	6%	2%	4%	2%	6%	2%	1%	2%	2%	
	4	5%	4%	4%	4%	5%	2%	3%	6%	3%	3%	3%	0%	
	5	8%	7%	3%	3%	3%	4%	3%	8%	6%	5%	5%	1%	
	6	7%	7%	5%	11%	4%	6%	9%	4%	4%	1%	7%	7%	
	7	11%	11%	7%	10%	6%	5%	11%	5%	3%	3%	9%	9%	
	8	8%	9%	13%	12%	10%	8%	7%	4%	17%	9%	9%	9%	
	9	12%	11%	13%	12%	13%	14%	8%	6%	7%	8%	11%	11%	
	10	8%	8%	10%	3%	9%	10%	9%	6%	8%	7%	9%	9%	
	11	8%	9%	10%	7%	9%	10%	6%	3%	6%	8%	16%	16%	
	12 12+	28%	25%	30%	22%	38%	34%	41%	32%	40%	50%	31%	31%	
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		

Figure 2.10 also identifies the ‘domain’ which the items cover and this reveals another aspect of the PSE measure. In the process for selecting potential necessities items, care is taken to ensure a distribution across a range of domains – food and diet, clothing and appearance, housing and home, etc.. When it comes to identifying people deprived at the 3+ threshold, however, only some of these domains are useful. Using the backward selection process, the 11 most important items comprise three which are financial (expenses, savings and pension), two on household goods (electrical and insurance), two on house and home (decorate and no damp), two health-related (dental and sport/exercise) and one each for clothing and appearance (clothes for job interview), and for social and leisure domain (hobby - although sport and exercise could also be placed in that category as well).

By contrast, two of the three items related to clothing and appearance, three of the four social and leisure items, and all three related to food and diet contribute very little to the identification of deprived adults at the 3+ items threshold as they have a low prevalence; they only tend to be lacked by people with higher levels of deprivation.

The Figure prompts us to ask whether our initial coverage of the different domains has been uneven. While we tried to identify possible necessities items to cover each domain, we did not consciously seek to ensure there were items with different levels of prevalence at the same time. On the other hand, a wide-ranging process was conducted with literature reviews, expert consultations and extensive qualitative research to generate the long list with which we started. There was certainly opportunity to extend coverage of all the domains.

One problem with finding items with a higher prevalence of lacking is that the public may not view them as necessities or large proportions may state that lack is about preference rather than affordability. Within food and diet, for example, four items were tested as possible necessities and only one was rejected: roast joint or equivalent each week. This item has the highest prevalence lacking due to affordability (7 per cent) but, unlike the other three, it has far more saying they lack it but do not want it (12 per cent) (Table 2.9). The same pattern holds for household goods and for social and leisure activities.

With clothing and appearance, there is a slight deviation. Six items were tested. The three which were rejected all had higher proportions lacking through affordability (7 to 12 per cent) than those accepted (4 to 7 per cent). For the rejected items, proportions lacking but not wanting range from 4 to 9 per cent, compared with 3 per cent, 4 per cent and 17 per cent for those accepted. The last of these therefore breaks the pattern but is unusual as it is appropriate

clothes for a job interview and the high number of not wanting responses reflects the views of older people who do not see this as appropriate to themselves.

The other deviation is with financial items. All of these have a high prevalence of lacking through affordability (16 to 34 per cent) but it is the least prevalent item which fails the test of public opinion (money to spend on self each week).

This does not rule out the possibility that the selection of items could have led to a more even spread of prevalence by domain but it does suggest that there are clear limits to this due to the test of public perceptions. This leads to an alternative interpretation of Figure 2.10: few people lack items from domains such as food and diet because incomes or resources rarely fall so low that such basic items are entirely unaffordable – other consumption will be sacrificed to protect these. They are an indicator of households who are much more deprived but they do not help to identify households around about the 3+ deprivation level. This raises important questions about McKay’s (2011) approach to selection which takes account of domains – see below.

Figure 2.10: Prevalence and order within scale by domain

Table 2.9: Prevalence of lacking through affordability by rejected and accepted items

Domain	Number of items		% lack, can't afford		% lack, don't want	
	Rejected	Accepted	Rejected	Accepted	Rejected	Accepted
Clothing and appearance	3	3	10%	6%	5%	8%
Comms and IT	3		4%		12%	
Financial	1	3	16%	29%	4%	14%
Food and diet	1	3	7%	4%	12%	4%
Health		2		12%		19%
House and home		4		9%		4%
Household goods	2	3	21%	13%	25%	7%
Social and leisure	10	4	15%	4%	21%	8%
Transport	1		9%		16%	
Total	21	22	13%	10%	16%	8%

Note: We leave out three items accepted by the public but which failed the reliability, validity or additivity tests.

Comparison of reduced adult scales

We can put all the UK and Scots measures side-by-side, assessing each by its ability to capture UK and Scots poor respectively at the 3+ threshold (Table 2.10 and Figure 2.11). The performance is very similar across the measures although the backward selection procedure almost always gives the best fit, with the prevalence and proportion approaches very close.

For the UK, the 11-item backwards selection scale captures 95 per cent of the poor. The same scale applied to Scotland captures 96 per cent of Scots poor – the same proportion as the Scots-based measure. The reason for this is that the same items make up the top 6 and top 11 for the UK and Scots-based backwards measures (Table 2.11). The ordering is slightly different within these groups but the result is the same at the 6- and 11-item points.

A very short scale could be considered in some situations and there is a suggestion from the tables below that six items could give a rough approximation. The UK or Scots scales of this length capture 86 per cent of the Scots poor but slightly less of the UK poor. It should be stressed, however, that the error (the proportion of adults poor on the PSE scale not captured by the reduced scale) is about three times greater.

Figure 2.11: Comparison of UK- and Scots-based measures in capturing Scots poor

Comparison with FRS measure

Table 2.11 also shows which items from the PSE reduced scale are included in the revised FRS measure. There is a poor fit with the revised FRS measure on adult items. That measure contains nine adult items, only five of which are in the PSE set of 22 items. Only four of those five would be included in the 11-item UK or Scots measure. One of the three items dropped from the FRS measure in the 2010/11 revisions (hobby) is included in the reduced PSE set.

Table 2.10: Comparison of measures in capturing UK and Scots poor adults

Number of items in measure	% of UK poor (UK measure)				% of Scots poor (UK measure)			% of Scots poor (Scots measure)		
	Prevalence (UK-based)	Proportion (UK-based)	Severity (UK-based)	Backward (UK-based)	Prevalence (UK-based)	Proportion (UK-based)	Backward (UK-based)	Prevalence (Scot-based)	Proportion (Scot-based)	Backward (Scots-based)
3	38%	50%	50%	50%	45%	59%	59%	59%	59%	59%
4	68%	68%	68%	68%	76%	76%	76%	76%	76%	76%
5	76%	76%	76%	76%	81%	81%	81%	81%	81%	81%
6	81%	81%	81%	81%	86%	86%	86%	83%	83%	86%
7	84%	84%	84%	87%	87%	87%	86%	85%	85%	87%
8	90%	88%	88%	90%	88%	90%	89%	90%	88%	90%
9	92%	92%	89%	92%	91%	91%	91%	91%	91%	92%
10	94%	94%	90%	94%	94%	94%	94%	94%	94%	94%
11	95%	95%	92%	95%	96%	96%	96%	96%	95%	96%
12	96%	96%	92%	96%	97%	97%	97%	97%	97%	97%

Table 2.11: Comparison the prevalence, proportion and severity measures – adult items

Order	Item	Prev.	Prop.	Sev.	Bwd.	Prev.	Prop.	Bwd.	Variable in FRS
		UK	UK	UK	UK	Scot	Scot	Scot	
1	Could household afford unexpected, but necessary, expense of £500	1	1	1	1	1	1	1	
2	Regular savings (of at least £20) for rainy days	2	2	2	2	2	2	2	Yes
3	Enough money to replace/repair broken electrical goods	4	3	3	3	3	3	3	Yes
4	Regular payments into an occupational or private pension	3	4	4	4	4	4	4	
5	Enough money to keep home in a decent state of decoration	5	5	5	5	5	5	6	Yes
6	All recommended dental work/treatment	6	6	6	6	8	9	5	
7	Damp-free home	8	9	15	7	9	12	9	
8	Taking part in sport/exercise activities or classes	9	8	8	8	6	7	7	
9	Home Insurance	7	7	7	9	7	6	11	Yes
10	A hobby or leisure activity.	10	10	11	10	11	10	8	
11	Appropriate clothes for job interviews	11	11	8	11	10	8	10	
12	Heating to keep home adequately warm	13	13	13	12	12	11	14	Yes
13	Table and chairs at which all the family can eat	15	15	19	13	14	15	16	
14	Visiting friends or family in hospital or other institutions	19	20	22	14	19	20	13	
15	Two pairs of all weather shoes	12	12	8	15	13	13	12	
16	Meat, fish or vegetarian equivalent every other day	16	16	14	16	16	16	20	
17	A warm waterproof coat	17	17	15	17	17	17	15	
18	Fresh fruit and vegetables everyday	14	14	11	18	15	14	17	
19	Celebrations on special occasions, such as Christmas	18	18	17	19	21	21	18	
20	Attending weddings, funerals and other such occasions	20	19	19	20	18	18	19	
21	Two meals a day	21	21	18	21	20	19	21	
22	Curtains or window blinds	22	22	21	22	22	22	22	

Note: “(Yes)” indicates that SHS records lack of item but not whether lack is due to affordability.

Backwards selection using other deprivation thresholds

Up to this point, we have tested different approaches to devising a reduced scale but all using the same basic criteria: the ability to identify adults regarded as poor on the main PSE scale, defined as lacking 3 or more items (34 per cent of adults). The backward selection approach appears to be most effective. Here, we repeat the analysis using this approach but exploring whether we would select a different set of items for the reduced scale if we have a different selection criteria. We compare the items selected on the basis of identifying people with 5+ and 7+ items lacked to those selected on the basis of the 3+ threshold; these correspond to 22 and 13 per cent of adults respectively.

As Table 2.12 shows, the lists of items we would use to identify more deprived groups are virtually identical to those used to identify the original (3+) group. There is no change in the top six items and almost no change in the top 11. The two items ranked 10 and 11 on the 3+ measure are just outside the top 11 on either or both the 5+ and 7+ - but only just. Two other indicators appear in the top 11 for the 5+ and 7+ measures: shoes for both (ranked 15 on the 3+ measure); and heating (5+ measure only, ranked 12 on the 3+ measure). Figure 2.12 shows the proportion of deprived people captured by each measure. This shows that more items are needed to capture the same proportion of deprived adults when using a more extreme threshold. To identify 95 per cent of people with 3+ deprivations requires 11 items, but to capture the same percentage of people with 5+ or 7+ deprivations requires 15 and 17 items respectively.

Table 2.12: Backwards selection – 3+, 5+ and 7+ thresholds – order of items

	3+	5+	7+
1	expenses	expenseshh	expenses
2	savings	savings	savings
3	elec	Elec	elec
4	pension	pension	pension
5	decorate	decorate	decorate
6	dental	dental	dental
7	nodamphh	insurancehh	sportex
8	sportex	nodamphh	insurancehh
9	insurancehh	sportex	hobby
10	hobby	Shoes	nodamphh
11	jobfrock	heating	shoes
12	heating	hobby	jobfrock
13	tablechhh	jobfrock	heating
14	hospital	tablechhh	tablechhh
15	shoes	hospital	vegfruit
16	meatfish	vegfruit	celebrat
17	warmcoat	warmcoat	meatfish
18	vegfruit	meatfish	warmcoat
19	celebrat	wedding	curtainshh
20	wedding	twomeal	hospital
21	twomeal	celebrat	wedding
22	curtainshh	curtainshh	twomeal

Note: the items lowest in the table were those removed first from the measure.

Figure 2.12: Backwards selection – 3+, 5+ and 7+ thresholds

However, there are other ways of assessing the effectiveness of the reduced scale at capturing deprivation on the full scale. First we can look at the overall correlation between the two. Across the full range of values, the correlation is 0.96; in other words, the reduced scale of 11 items captures 93 per cent of the variation in the full measure. This is perhaps unsurprising since the majority of people on both measures record no deprivations. Even if we exclude those people, however, the correlation is still 0.94.

Second, we can examine how well the reduced scale ‘tuned’ to identify deprivation at the 3+ level accurately identifies more deprived groups, but making allowance for the fact that, at higher deprivation levels, the scales will diverge. At low levels of deprivation, the scales provide similar measures because the less prevalent items play little role: lacking three items from 11 is essentially the same threshold as lacking three items from 22. At higher levels, however, this is no longer the case: a threshold of lacking seven items from 11 is a rather more severe test than lacking seven items from 22. We can estimate the appropriate corresponding values by looking at the mean or median values on the full scale for each level of the reduced scale (Table 2.13 and Figure 2.13). Missing five items from 11 is equivalent to missing 6 from the full scale, while missing 8 from 11 is equivalent to missing 10 from 22.

Figure 2.13 is interesting as it shows that there are very few outliers or extreme values: cases where the deprivation score on the PSE scale is far greater than that on the reduced scale.

Figure 2.13: Equivalence of reduced and PSE scales

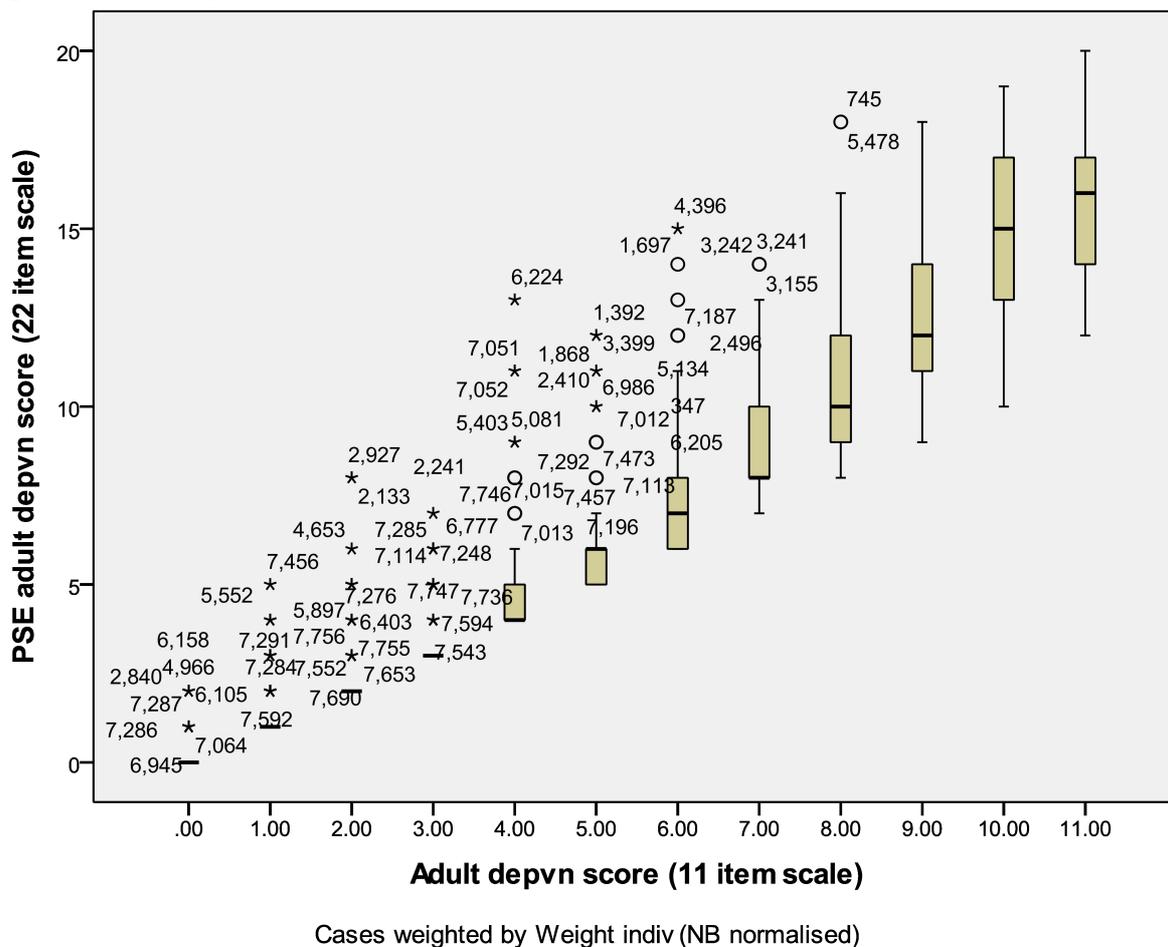


Table 2.13: Equivalence of reduced and PSE scales - UK

Adult depvn score (11 item scale)	PSE adult depvn score (22 item scale)		
	Mean	Median	N
0	.0	0	3295
1	1.1	1	1224
2	2.2	2	685
3	3.3	3	546
4	4.7	4	523
5	6.0	6	394
6	7.4	7	355
7	8.8	8	296
8	10.6	10	203
9	12.3	12	103
10	14.8	15	46
11	15.7	16	13

Using these correspondences, we can provide a fairer test of how well the reduced scale performs when being used to identify higher levels of deprivation (Table 2.14). Using 11 items, we correctly identify 93 per cent of adults lacking 6+ items (the most deprived 18 per cent) and 86 per cent per cent of people lacking 7+ items (the most deprived 13 per cent). At these levels, there is a very modest problem of mis-identification. For example, 3 per cent of people who were not lacking 6 items on the full scale were measured as lacking 5 items on the reduced scale. This equates to 14 per cent of all those lacking 5+ items on the short scale.

Table 2.14: Comparison of PSE and reduced scales at different thresholds - UK

Short scale	PSE scale equivalent	% poor (short scale)	% poor (PSE scale)	% PSE	
				poor capture	non-poor capture
3+	3+	32%	34%	95%	0%
4+	4+	25%	27%	93%	0%
5+	6+	18%	17%	93%	3%
6+	7+	13%	13%	86%	2%
7+	8+	9%	10%	75%	1%
8+	10+	5%	5%	69%	1%

We can repeat the last stage of the analysis for Scotland. The reduced scale has the same 11 items. The overall correlation is virtually identical: 0.96 for all cases, and 0.94 excluding those with no deprivations. The equivalence levels are slightly different (Table 2.15). The reduced scale is at least as effective as in the UK (Table 2.16).

Table 2.15: Equivalence of reduced and PSE scales - Scotland

Adult depvn score (11 item scale)	PSE adult depvn score (22 item scale)		
	Mean	Median	N
0	.0		882
1	1.1	1	284
2	2.1	2	146
3	3.3	3	110
4	4.4	4	119
5	6.2	6	70
6	7.2	7	57
7	9.5	9	59
8	11.3	11	36
9	12.8	12	14
10	13.3	14	10

Table 2.16: Comparison of PSE and reduced scales at different thresholds – Scotland

11-item scale	PSE scale	% poor (short scale)	% poor (PSE scale)	% PSE poor captured	% PSE non-poor captured
3+	3+	27%	28%	96%	0%
4+	4+	20%	22%	93%	0%
5+	6+	14%	13%	94%	2%
6+	7+	10%	10%	83%	1%
7+	9+	7%	6%	87%	2%
8+	11+	3%	3%	61%	1%

Finally, Figure 2.14 combines the results for the UK and for Scotland. It shows the threshold level of poverty along the bottom: i.e. how extreme is the group we are trying to identify. On the vertical axis it shows the proportion of this group correctly identified. The reduced scales have been constructed using the broadest definition of poor (lacking 3+ items – the poorest 34 per cent and 28 per cent of the population respectively) but the Figure shows that they are still effective at identifying groups with much higher levels of deprivation (around about the poorest 14 or 15 per cent at least). The reduced scale performs particularly well in Scotland.

Figure 2.14: Reduced versus full scales – UK and Scotland

Note: labels next to lines indicate the number of items lacking on the full PSE scale.

3. Reduced scale for children

With child deprivation, there is some discussion to be had about which group of ‘poor’ children we want to be able to capture, i.e. what deprivation threshold we wish to use. We have used the threshold identified by Main and Bradshaw of missing two or more necessities. On this measure, 36 per cent of children in the UK are deprived and 32 per cent in Scotland (Table 3.1). With adults, we used the threshold of three or more deprivations, giving 34 per cent of UK adults and 28 per cent of the Scottish adults. The two measures therefore capture poverty at about the same level.

Table 3.1: Adult and child deprivation in the UK and Scotland

	Deprivation level	Adults	Children
UK	2+	43%	36%
	3+	34%	26%
Scot	2+	36%	32%
	3+	28%	21%

Prevalence-based measures

We look first at the relative prevalence of lacking items for the UK and Scotland (Table 3.2 and Figure 3.1). As with adult data, the prevalence of different items is very similar between the UK and Scotland with Scotland showing slightly lower levels of lacking through affordability across the board. Children in Scotland are more likely to lack enough bedrooms for those over 10 but less likely to lack money to attend clubs or activities, pocket money or day trips with the family once a month.

To an even greater extent than with adult items (Figure 2.1 above), the items cluster at the low end of the scale. Given that the analysis of adult items showed the importance of the more prevalent items in driving the reduced scale, we may anticipate that the reduced child scale will lean even more heavily on a small number of items.

Table 3.2: Prevalence of child items – UK and Scotland

Order	Item	UK	Scotland
1	Money to save	31%	29%
2	A holiday away from home at least one week a year	26%	25%
3	Day trips with family once a month	21%	16%
4	Pocket money	16%	11%
5	Enough bedrooms for every 10+ of diff sex to have own	12%	16%
6	Childrens clubs or activities e.g. drama, football	9%	3%
7	Computer and internet for homework	7%	6%
8	A hobby or leisure activity	7%	3%
9	Going on a school trip at least once a term	6%	3%
10	Outdoor leisure equipment, e.g. skates, football, etc.	6%	2%
11	A suitable place at home to study or do homework	5%	5%
12	Garden or outdoor space nearby where can play safely	5%	3%
13	At least four pairs of trousers, leggings, jeans etc.	5%	2%
14	Some new, not second-hand clothes	4%	2%
15	Construction toys such as Duplo/Lego etc	4%	4%
16	New, properly fitting shoes	4%	1%
17	Fresh fruit or vegetables at least once a day	3%	2%
18	Toddler group, etc. at least once a week (pre-school)	3%	3%
19	Meat, fish or vegetarian equivalent at least once a day	3%	1%
20	Books at home suitable for their ages	2%	1%
21	Celebrations on special occasions, e.g. Birthdays	1%	1%
22	Indoor games suitable for their ages	1%	0%
23	A warm winter coat	1%	2%
24	Three meals a day	1%	0%

Notes: Weighted data – around 2900 cases for UK and 600 for Scotland. Percent “lacking/don’t do, unable to afford”. Other responses (have/do; don’t have/do, don’t want; and unallocated) all treated as the contrast.

Figure 3.1: Prevalence of child items – UK and Scotland

Using items ordered in this way, we construct scales with between 3 and 14 items, following McKay’s (2011) approach. As with adult items, we examine the proportion of the ‘poor’ (lacking 2 or more necessities) captured by each measure. Again as previously, we do this: using a UK-based measure to assess the proportion of the UK poor captured; then using the same UK-based measure to assess the proportion of the Scottish poor captured; and finally using a Scottish-based measure to assess the proportion of the Scottish poor captured (Table 3.3 and Figure 3.2).

The three measures perform in a very similar manner when trying to capture the Scottish poor, and there is little to choose between them. With the six item UK-based scale, we can capture 83 per cent of the UK poor and 86 per cent of the Scots poor, the latter is the same as the six-item Scots-based scale. There is also a suggestion from Figure 3.2 that the seventh item is particularly useful and, if brought in to the first six, would improve the measures significantly. With 11 items, we can capture 94 per cent of the Scots poor using the Scots-

based measure and 93 per cent using the UK-based measure. Beyond 11 items, there are quite modest further gains.

Table 3.3: Percent of UK and Scottish poor captured by prevalence-based measures

Number of items in measure	% of poor (3+ deprivations) captured by measure:		
	UK defn, UK poor	UK defn, Scot poor	Scot defn, Scot poor
3	65%	70%	70%
4	75%	75%	83%
5	80%	86%	86%
6	83%	86%	86%
7	86%	90%	90%
8	88%	90%	91%
9	90%	91%	91%
10	91%	92%	93%
11	93%	93%	94%
12	96%	94%	95%
13	96%	94%	96%
14	96%	95%	96%

Figure 3.2: Prevalence-based measures of child deprivation – UK and Scotland

Proportions-based measures

The second approach looks at the proportion of the poor lacking each item, rather than the proportion of the whole population. As Table 3.4 and Figure 3.3 show, there is close agreement again. The largest differences occur on the same items as with overall prevalence.

Table 3.4: Proportion of poor children lacking each item – UK and Scotland

Order	Item	UK	Scot
1	Money to save	74%	77%
2	A holiday away from home at least one week a year	63%	67%
3	Day trips with family once a month	54%	46%
4	Pocket money	42%	33%
5	Enough bedrooms for every 10+ of diff sex to have own	29%	41%
6	Childrens clubs or activities e.g. drama, football	23%	7%
7	A hobby or leisure activity	18%	9%
8	Computer and internet for homework	16%	17%
9	Going on a school trip at least once a term	16%	9%
10	Outdoor leisure equipment, e.g. skates, football, etc.	16%	7%
11	A suitable place at home to study or do homework	15%	16%
12	Garden or outdoor space nearby where can play safely	13%	8%
13	At least four pairs of trousers, leggings, jeans etc.	13%	7%
14	Some new, not second-hand clothes	12%	6%
15	Construction toys such as Duplo/Lego etc	11%	7%
16	New, properly fitting shoes	10%	4%
17	Fresh fruit or vegetables at least once a day	9%	7%
18	Toddler group, etc. at least once a week (pre-school)	8%	8%
19	Meat, fish or vegetarian equivalent at least once a day	8%	3%
20	Books at home suitable for their ages	6%	2%
21	Celebrations on special occasions, e.g. Birthdays	4%	2%
22	Indoor games suitable for their ages	4%	0%
23	A warm winter coat	3%	5%
24	Three meals a day	3%	0%

Figure 3.3: Proportion of poor children lacking each item – UK and Scotland

As previously, we use the rankings for UK and Scotland to create two sets of measures with gradually increasing numbers of items. We show in Table 3.5 and Figure 3.4 the proportions of the poor in the UK and Scotland captured by each. These measures again perform in a very similar manner to each other, converging in the later stages. With the six items on the Scots-based measure, we capture 90 per cent of the Scots poor. With eleven items on the same scale, we capture 95 per cent. Beyond this point, further additions produce diminishing returns.

Table 3.5: Percent of poor children captured by proportions-based measures

Number of items in measure	% of poor (3+ deprivations) captured by measure		
	UK defn, UK poor	UK defn, Scot poor	Scot defn, Scot poor
3	65%	70%	70%
4	75%	75%	83%
5	80%	86%	86%
6	83%	86%	90%
7	86%	86%	91%
8	88%	90%	91%
9	90%	91%	92%
10	91%	92%	93%
11	93%	93%	95%
12	96%	94%	95%
13	96%	94%	95%
14	96%	95%	96%

Figure 3.4: Proportions-based measures of child poverty

Severity-based measures

Thirdly, we look at the ordering of items by severity, drawing on the analysis in Main and Bradshaw (2013). Two severity ratings are shown: for all children and for those 10-17 only (Table 3.6). Some items are age-specific (bedrooms for children 10+ of different sex; and toddler group etc.). As a result there is a high level of missing data for these items when analysing all households with children and that appears to skew the measures of severity in these cases. Repeating the analysis only for those with children 10 or over reduces the severity rating for the bedrooms item considerably. However, even then, its severity puts it outside the top 14 so it does not affect our analysis. We therefore work with the rankings from the analysis for all children.

Table 3.6: Severity of items – UK only

Order	Item	Severity	
		0-17	10-17
1	A holiday away from home at least one week a year	0.9	0.9
2	Money to save	1	0.7
3	Day trips with family once a month	1.1	1.1
4	Pocket money	1.5	1.4
5	At least four pairs of trousers, leggings, jeans etc.	2	1.8
6	Childrens clubs or activities e.g. drama, football	2	2
7	New, properly fitting shoes	2	1.9
8	Outdoor leisure equipment, e.g. skates, football, etc.	2	2.1
9	A hobby or leisure activity	2.2	1.9
10	Fresh fruit or vegetables at least once a day	2.2	2.2
11	Going on a school trip at least once a term	2.2	2
12	Meat, fish or vegetarian equivalent at least once a day	2.2	2.1
13	Some new, not second-hand clothes	2.2	2
14	A warm winter coat	2.3	2.3
15	Three meals a day	2.3	2.3
16	Books at home suitable for their ages	2.4	2.4
17	A suitable place at home to study or do homework	2.6	2.4
18	Celebrations on special occasions, e.g. Birthdays	2.6	2.2
19	Computer and internet for homework	2.6	2.8
20	Garden or outdoor space nearby where can play safely	2.7	2.4
21	Indoor games suitable for their ages	2.7	2.8
22	Construction toys such as Duplo/Lego etc	2.9	3
23	Enough bedrooms for every 10+ of diff sex to have own	3.1	2.2
24	Toddler group, etc. at least once a week (pre-school)	4.7	n/a

Note: Severity figures from Main and Bradshaw (2013).

We make one measure based on UK severity scores, and apply this to UK and Scottish data (Table 3.7 and Figure 3.5). This measure does not perform as well as the previous two. There is little improvement in the measure beyond four items particularly in terms of the ability to capture poor children in Scotland.

Table 3.7: Severity-based measure – UK and Scottish poor children

Number of items in measure	% of poor (3+ deprivations) captured by measure	
	UK defn, UK poor	UK defn, Scot poor
3	65%	70%
4	75%	75%
5	76%	75%
6	79%	76%
7	79%	76%
8	80%	77%
9	83%	77%
10	83%	78%
11	85%	79%
12	86%	80%
13	87%	80%
14	87%	82%

Figure 3.5: Severity-based measure – UK and Scottish poor children

Backward selection

The final approach is to start from the full set of 24 child items and to remove items one at a time. At each stage, we remove the item which makes least difference to the number of children identified as poor by the remaining set. The results for the UK are shown in Table 3.8 and Figure 3.6.

With 11 items, we can pick up 95 per cent of the UK and the Scots ‘poor’ identified by the full measure; 6 items capture 84 per cent and 90 per cent respectively. The fit of the measure continues to improve beyond 11 items – it is less obvious that this is the best length for the reduced scale.

Table 3.8: Backwards selection of items – UK-based

Items in measure	Item to be dropped	UK-based, UK poor	UK-based, Scots poor
24	cmealhh	100%	100%
23	cgameshh	100%	100%
22	cbookshh	100%	100%
21	ccoathh	100%	100%
20	ctrouershh	100%	98%
19	cclotheshh	100%	98%
18	ccelebhh	100%	97%
17	cmeathh	100%	97%
16	cshoeshh	99%	97%
15	cveghh	99%	97%
14	cleisurehh	98%	96%
13	chobbyhh	97%	96%
12	clegohh	96%	96%
11	cplaygrp	95%	95%
10	cclubshh	93%	93%
9	cschoolhh	92%	93%
8	cgardenhh	90%	92%
7	cstudyhh	87%	91%
6	cpchh	84%	90%
	cbedroomh		
5	h	80%	86%
4	cmoneyhh	75%	75%
3	ctriphh	65%	70%

Note: the two items included in the last measure are: savings and holiday.

Figure 3.6: Backwards selection of items – UK-based measure

We can repeat the exercise using Scottish data to determine the selection of items (Table 3.9 and Figure 3.7). The Figure also includes the previous result of using the UK-based measure on the Scots poor for comparison. The results are very close. Although the Scots-based measure performs slightly better at various points, the measures are equally good at the crucial points in the range (6 and 11 items) which we have been focussing on. In the case of the Scots-based measure, as with the UK measure, the fit continues to improve at much the same rate beyond 11 items up to 14 items at which point it captures 98 per cent of the Scots poor children.

Table 3.9: Backwards selection of items – Scots-based

Items in measure	Item dropped	Scots-based, Scots poor
24	cmealhh	100%
23	cgameshh	100%
22	cbookshh	100%
21	ccelebhh	100%
20	cmeathh	100%
19	cshoeshh	100%
18	chobbyhh	100%
17	cclubshh	100%
16	cleisurehh	99%
15	clegohh	99%
14	cveghh	98%
13	cschoolhh	97%
12	cstudyhh	96%
11	cclotheshh	95%
10	cgardenhh	94%
9	ccoathh	93%
8	ctrousersh	91%
7	cplaygrphh	91%
6	cmoneyhh	90%
5	cpchh	87%
4	ctriphh	83%
	cbedroomh	
3	h	72%
2		52%

Note: the two items included in the last measure are: savings and holidays.

Figure 3.7: Backwards selection – Scots-based and UK-based

Lacking items by level of deprivation

Figure 3.8 shows the distribution of children who lack each item in terms of their level of deprivation across all 24 items (UK data). The items are sorted left-to-right in descending order of prevalence. As before, the items which are more commonly lacked also tend to be lacked by people with lower levels of deprivation. With items lacked by relatively few children, they only tend to be lacked by those with high levels of deprivation. This relationship can also be seen in the ordering of items in the backwards selection process. We can plot the ordering by prevalence to show the relationship (Figure 3.9).

Figure 3.9 identifies the ‘domain’ which the items cover and this again reveals an interesting feature of the PSE measure. As with adults, the items from each domain are not evenly distributed. None of the food and diet items or the clothing and appearance items make it into the top 11 but both the financial items do, as do three of the four education and development items.

Table 3.10 explores whether the items rejected at the public opinion stage were different to those included. There are far fewer child items rejected so comparisons can only be made in three domains but, overall, the same pattern holds as previously. In clothing and appearance, for example, two items which were tested did have higher prevalence but these were rejected by the public (designer trainers and clothes to fit in with friends). They also had very high proportions lacking but not wanting them. The low number of rejected items combined with the high number of items with low prevalence (lacking through affordability) does suggest that, in future, greater efforts might be made to find items which more children lack by pushing at the boundaries of public opinion to a greater extent.

Figure 3.8: Distribution of children lacking each item by level of deprivation - UK

Lacking		31%	26%	21%	16%	12%	9%	7%	7%	6%	6%	5%	5%	5%
Order		1	2	3	4	5	10	6	13	9	14	7	8	20
Adult depvn score		csavinghh	cholidayhh	ctriphh	cmoneyhh	cbathroomhh	cclubshh	cpchh	chobbyhh	cschoolhh	cleisurehh	cstudyhh	cgardenhh	ctrousersh
	0		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1		13%	12%	5%	1%	12%	4%	16%	3%	7%	1%	3%	4%	5%
2		16%	13%	13%	8%	19%	6%	6%	6%	10%	3%	16%	17%	1%
3		17%	17%	19%	18%	13%	10%	10%	8%	9%	7%	8%	2%	9%
4		9%	10%	8%	7%	9%	3%	7%	3%	5%	7%	5%	14%	3%
5		12%	12%	12%	15%	14%	19%	7%	15%	11%	11%	15%	10%	5%
6		7%	5%	8%	9%	6%	7%	10%	8%	11%	13%	9%	10%	17%
7		4%	4%	5%	7%	2%	8%	7%	3%	8%	4%	2%	5%	10%
8		8%	9%	10%	13%	8%	14%	9%	18%	9%	13%	24%	7%	6%
9		5%	7%	8%	9%	4%	8%	10%	17%	8%	13%	7%	10%	16%
10		2%	2%	3%	2%	3%	4%	4%	3%	5%	6%	1%	6%	5%
11		2%	2%	3%	3%	3%	6%	6%	6%	6%	7%	2%	1%	4%
12 12+		4%	5%	6%	7%	6%	11%	8%	11%	11%	15%	9%	16%	20%
Total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

		Lacking	4%	4%	4%	3%	3%	3%	2%	1%	1%	1%	1%
		Order	19	12	16	15	11	17	22	18	23	21	24
Adult depvn score		cclotheshh	clegohh	cshoeshh	cveghh	cplaygrphh	cmeathh	cbookshh	ccelebh	cgameshh	ccoathh	cmealhh	
	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	1	0%	4%	0%	3%	3%	1%	0%	3%	0%	0%	0%	0%
	2	2%	12%	5%	4%	18%	4%	0%	5%	0%	4%	0%	0%
	3	3%	16%	0%	3%	7%	8%	3%	3%	0%	0%	0%	0%
	4	1%	7%	2%	12%	4%	5%	6%	10%	0%	0%	3%	3%
	5	16%	8%	7%	1%	12%	4%	7%	4%	8%	4%	0%	0%
	6	8%	3%	9%	7%	5%	4%	15%	15%	22%	1%	0%	0%
	7	9%	4%	9%	4%	3%	4%	4%	0%	7%	0%	3%	3%
	8	19%	12%	11%	15%	18%	18%	13%	5%	5%	11%	15%	15%
	9	16%	8%	15%	12%	7%	13%	3%	12%	14%	14%	1%	1%
	10	8%	4%	6%	7%	9%	7%	6%	0%	3%	5%	7%	7%
	11	0%	7%	7%	7%	10%	0%	11%	5%	0%	6%	21%	21%
	12 12+	18%	16%	28%	25%	3%	33%	31%	38%	41%	55%	51%	51%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	

Figure 3.9: Prevalence and order within scale by domain

Table 3.10: Prevalence of lacking through affordability by rejected and accepted items

Domain	Number of items		% lack, can't afford		% lack, don't want	
	Rejected	Accepted	Rejected	Accepted	Rejected	Accepted
Clothing and appearance	2	4	13%	3%	22%	1%
Comms and IT	2	1	10%	6%	32%	10%
Education & devt.		4		4%		12%
Financial		2		20%		14%
Food and diet		3		2%		2%
House and home		1		8%		8%
Social and leisure	2	9	6%	8%	14%	9%
Grand Total	6	24	10%	7%	23%	8%

Note: We leave out three items accepted by the public but which failed the reliability, validity or additivity tests.

Comparison of reduced child scales

In Table 3.11, we show all the series for comparison. As with adults, the backwards selection method works best in each case. Figure 3.10 compares the UK- and Scots-based backwards selection methods in terms of their ability to capture the Scots poor.

For the UK measure, an 11 item scale captures 95 per cent of poor children. The same UK-based measure captures 95 per cent of Scots poor children, and the Scots-based measure performs just as well. The addition of up to three more items continues to provide a better fit so there is certainly a case for a scale of up to 14 items. A 14-item UK scale captures 98 per cent of poor children while the Scottish equivalent captures 98 per cent of Scots poor children. The longer UK scale does not perform much better in Scotland.

The reduced 6-item scales again provide an acceptable fit for situations where very short instruments are required although, as previously, errors are substantially larger.

Table 3.11: Comparison of measures in capturing UK and Scots poor children

Number of items in measure	% of UK poor (UK measure)				% of Scots poor (UK measure)			% of Scots poor (Scots measure)		
	Prevalence (UK-based)	Proportion (UK-based)	Severity (UK-based)	Backward (UK-based)	Prevalence (UK-based)	Proportion (UK-based)	Backward (UK-based)	Prevalence (Scot-based)	Proportion (Scot-based)	Backward (Scots-based)
3	65%	65%	65%	65%	70%	70%	70%	70%	70%	72%
4	75%	75%	75%	75%	75%	75%	75%	83%	83%	83%
5	80%	80%	76%	80%	86%	86%	86%	86%	86%	87%
6	83%	83%	79%	84%	86%	86%	90%	86%	90%	90%
7	86%	86%	79%	87%	90%	86%	91%	90%	91%	91%
8	88%	88%	80%	90%	90%	90%	92%	91%	91%	91%
9	90%	90%	83%	92%	91%	91%	93%	91%	92%	93%
10	91%	91%	83%	93%	92%	92%	93%	93%	93%	94%
11	93%	93%	85%	95%	93%	93%	95%	94%	95%	95%
12	96%	96%	86%	96%	94%	94%	96%	95%	95%	96%
13	96%	96%	87%	97%	94%	94%	96%	96%	95%	97%
14	96%	96%	87%	98%	95%	95%	96%	96%	96%	98%

Figure 3.10: Comparison of UK- and Scots-based backwards measures in capturing Scots poor children

In Table 3.12, we show the individual items included in each measure with their rank order. These are sorted based on the ordering of items on the UK backwards selection column. Looking at the two backwards selection columns, there is complete agreement on the top six items and near unanimity on the top 11. Three items in the top 11 on the UK measure are not in the top 11 for Scotland but all are still ranked fairly high (12th, 13th and 17th).

Comparison with FRS measure

The revised FRS measure has 12 child items. One of these is not seen as necessities in the PSE as they lack majority support (friends round once a fortnight). Of the remaining eleven, only two are in our top 6 for the UK- and Scots-based measures. The 11 item UK-based measure includes only six FRS items. The equivalent Scottish measure includes just five. At least half of the FRS items would not therefore appear in either UK- or Scots-based measures.

In updating the FRS measure, three new child items were added: fresh fruit and vegetables daily, warm winter coat, and clubs and activities. None of these make it into the top 6. Clubs and activities is in the top 11 on the UK measure while warm coat is in the top 11 on the Scots measure. Fresh fruit and vegetables is not in the top 11 on either.

The reasons given by McKay (2011) for selecting these three replacement items are interesting. They stem from the domain covered by the item and/or the level of public support. Given the analysis above, both criteria look inappropriate. Warm winter coat is included on the basis of high public support. Clubs and activities has relatively low public support (59 per cent) but is seen as a replacement for swimming so domain is the criteria. Fresh fruit and vegetables is justified on both grounds: it has high public support and covers “something of a gap towards diet-based questions” (p25).

Domains appear inappropriate criteria (and food and diet especially) because they vary greatly in terms of the level of deprivation at which they tend to be lacked. Food and diet items are typically only lacked by people with high levels of deprivation. They are not appropriate or useful items in a scale which aims to distinguish a broader group of poor from non-poor. Public support is also unhelpful beyond the majority threshold since the items which attract near unanimous levels of support tend to have much lower prevalence of lacking through affordability and hence again only tend to be lacked by people with high levels of deprivation. The one new item which McKay adds which is also in the PSE reduced set (clubs and activities) is added for the wrong reason (domain) and added in spite of low public support.

Table 3.12: Comparison of prevalence, proportion and severity measures – child items

Order	Item	Prev.	Prop.	Sev.	Bwd.	Prev.	Prop.	Bwd.	Variable in FRS
		UK	UK	UK	UK	Scot	Scot	Scot	
1	Money to save	1	1	2	1	1	1	1	
2	A holiday away from home at least one week a year	2	2	1	2	2	2	2	Yes
3	Day trips with family once a month	3	3	3	3	3	3	4	
4	Pocket money	4	4	4	4	5	5	6	
5	Enough bedrooms for every 10+ of diff sex to have own	5	5	23	5	4	4	3	Yes
6	Computer and internet for homework	7	8	17	6	6	6	5	
7	A suitable place at home to study or do homework	11	11	17	7	7	7	12	
8	Garden or outdoor space nearby where can play safely	12	12	20	8	12	10	10	Yes
9	Going on a school trip at least once a term	9	9	9	9	10	9	13	Yes
10	Childrens clubs or activities e.g. drama, football	6	6	5	10	13	12	17	Yes
11	Toddler group, etc. at least once a week (pre-school)	18	18	24	11	9	11	7	Yes
12	Construction toys such as Duplo/Lego etc	15	15	22	12	8	14	15	
13	A hobby or leisure activity	8	7	9	13	11	8	18	Yes
14	Outdoor leisure equipment, e.g. skates, football, etc.	10	10	5	14	16	16	16	Yes
15	Fresh fruit or vegetables at least once a day	17	17	9	15	15	15	14	Yes
16	New, properly fitting shoes	16	16	5	16	19	19	19	
17	Meat, fish or vegetarian equivalent at least once a day	19	19	9	17	20	20	20	
18	Celebrations on special occasions, e.g. Birthdays	21	21	17	18	21	21	21	Yes
19	Some new, not second-hand clothes	14	14	9	19	17	17	11	
20	At least four pairs of trousers, leggings, jeans etc.	13	13	5	20	14	13	9	
21	A warm winter coat	23	23	14	21	18	18	8	Yes
22	Books at home suitable for their ages	20	20	16	22	22	22	22	
23	Indoor games suitable for their ages	22	22	20	23	23	23	23	
24	Three meals a day	24	24	14	24	23	23	24	

Backwards selection using other thresholds

The reduced scale has been developed using the relatively low threshold of lacking 2+ items. This corresponds to 37 per cent of children in the UK. To explore how well the reduced scale captures groups with higher levels of deprivation, we follow the same procedure as with adult items. For reasons of time, we do not repeat the effort to construct the scale using higher thresholds. Instead, we focus on how well the existing reduced scale captures more deprived groups.

The overall correlation between the reduced scale and the full scale is 0.94; alternatively we can say that 89 per cent of the variance is captured by the reduced scale. If we omit cases with no deprivation, the correlation is 0.90. Although slightly lower than with adult deprivation, these are still very close fits.

The boxplot in Figure 3.11 shows the spread of deprivation scores on the full scale for each level of the reduced scale. Again, there are very few extreme values. Table 3.13 shows the corresponding values on each scale.

Figure 3.11: Equivalence of reduced and full PSE scales – children in UK

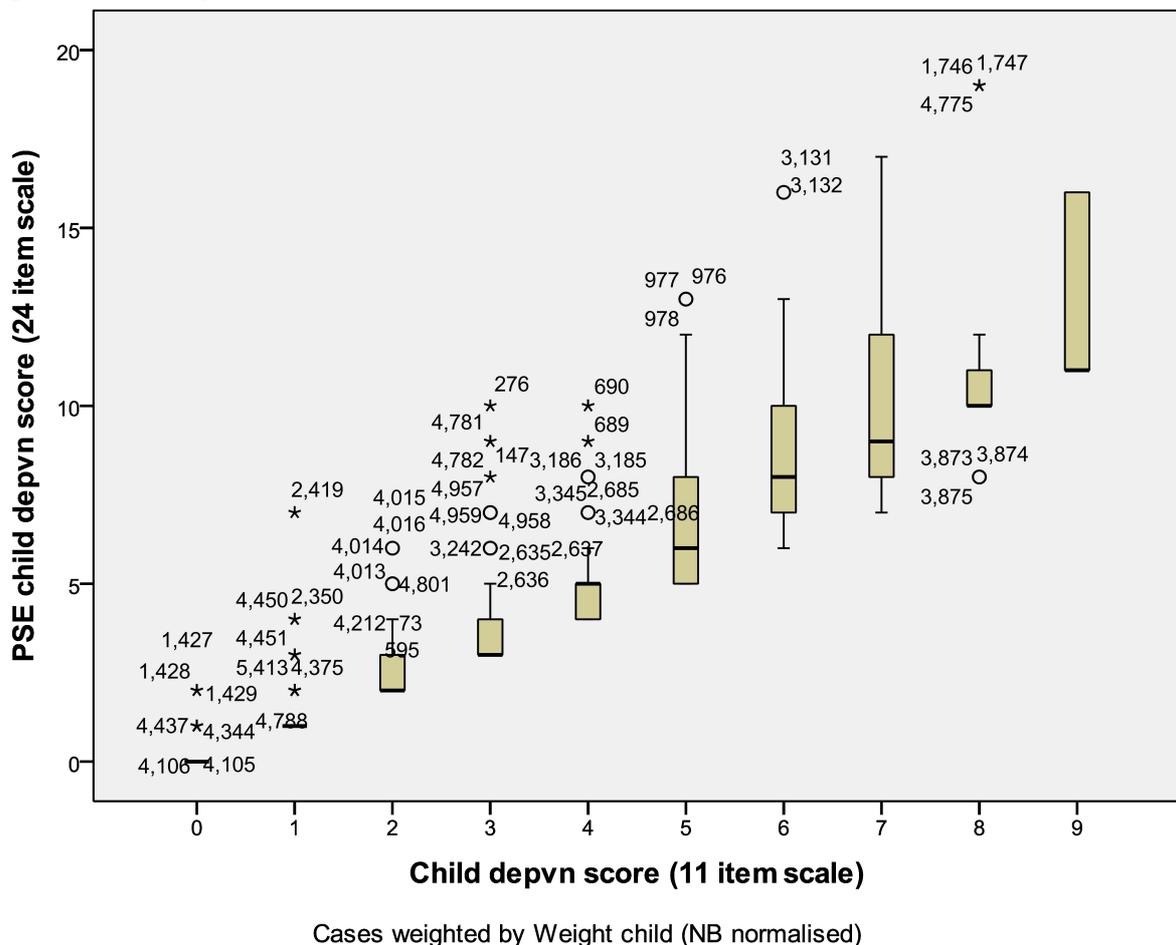


Table 3.13: Equivalence of reduced and full PSE scales – children in UK

Child depvn score (11 item scale)	PSE child depvn score (24 item scale)		
	<i>Mean</i>	<i>Median</i>	<i>N</i>
0	.0	0	1475
1	1.2	1	411
2	2.4	2	331
3	3.6	3	220
4	5.2	5	159
5	6.9	6	125
6	9.0	8	67
7	9.9	9	70
8	10.7	10	17
9	12.9	11	6

Using the corresponding values, we can show how well the reduced scale captures more deprived groups (Table 3.14). As with the adult scales, the reduced scale performs very well at least as far as the most deprived 15 per cent of children. At this level, children lack 5+ items on the main scale compared with 4+ on the reduced scale. The latter group captures 90 per cent of those regarded as poor on the full scale.

Table 3.14: Comparison of PSE and reduced scales at different thresholds – Scotland

11-item scale	PSE scale	% poor (short scale)	% poor (PSE scale)	% PSE poor captured	% PSE non-poor captured
2+	2+	35%	37%	95%	0%
3+	3+	23%	26%	87%	0%
4+	5+	15%	15%	90%	2%
5+	6+	10%	11%	80%	2%
6+	8+	6%	7%	67%	1%
7+	9+	3%	4%	48%	1%

4. Validation of measures

One way of providing a further check on the reduced scales is to look at the extent to which they pick up – or fail to pick up – poverty for different groups. Ideally, the profile of people picked up by the reduced measures should be the same as that of people identified as poor on the full scales, i.e. the missed individuals would have the same characteristics as those picked up. The analysis here is restricted to adults for reasons of time.

Table 4.1 shows the characteristics of people who are poor on the full scale and on the two reduced adult scales (11 and 6 items), for both the UK and Scotland. There are only very minor differences. This is hardly surprising for the 11 item scale since it captures about 95 per cent of those identified as poor on the full scale.

Table 4.2 is a more sensitive test, comparing the characteristics of those poor on the PSE measure with the characteristics of those poor on that measure but not seen as poor on the other two i.e. the cases which are ‘missed’ by the shorter scales. The number of cases is quite small which is why results are shown only for the UK as a whole. Compared with all adults lacking three or more items, the ‘missed’ group are more likely to be: 65 or over, be in pensioner or all adult households, in work rather than unemployed or inactive, in intermediate occupations, and to have a degree.

Another way of looking at the different measures is to compare levels of poverty or deprivation between: those not regarded as poor on the main measure; those regarded as poor on the main measure but missed by the shorter version; and those captured by both measures. Figures 4.1 and 4.2 show adult deprivation score and subjective poverty rates for these three groups using the 11-item and 6-item scales respectively. The group who are ‘missed’ are clearly less deprived on average than those captured by both measures. In other words, the shorter scales have a tendency to pick up people who are slightly more deprived than the full scale.

Table 4.1: Characteristics of poor adults on UK and Scottish scales

		UK			Scotland		
		22	11	6	22	11	6
		item	item	item	item	item	item
Gender	Male	45%	45%	44%	40%	40%	40%
	Female	55%	55%	56%	60%	60%	60%
Age	18-24	16%	16%	15%	10%	10%	11%
	25-34	23%	24%	24%	20%	20%	21%
	35-44	22%	22%	21%	25%	26%	26%
	45-54	18%	18%	19%	21%	22%	22%
	55-64	11%	11%	12%	13%	13%	13%
	65-79	7%	7%	7%	9%	8%	6%
	80+	2%	2%	2%	1%	1%	1%
Ethnicity	White	87%	87%	88%	98%	98%	98%
	Asian	6%	6%	5%	1%	1%	1%
	Other	7%	7%	7%	1%	1%	1%
HHld type	Pensioner	13%	12%	12%	14%	13%	11%
	Single/cpl	28%	29%	30%	39%	40%	40%
	Cpld+ch	33%	33%	32%	24%	24%	24%
	LP	9%	9%	10%	10%	11%	12%
	3+ch	7%	7%	7%	7%	7%	7%
	3+ ads	9%	9%	8%	5%	5%	6%
Emplt status	Emplt/SE FT	40%	40%	38%	37%	37%	37%
	Emplt/SE PT	13%	13%	13%	14%	14%	14%
	Unemp	12%	12%	13%	13%	14%	15%
	Inactive	35%	35%	36%	36%	36%	34%
NS-SEC	Mgrl/prof	26%	26%	25%	23%	22%	21%
	Intermed	19%	18%	18%	20%	19%	18%
	Small emplr etc.	7%	7%	7%	4%	5%	5%
	Lower supervis	6%	6%	6%	6%	6%	6%
	Semi/Routine	42%	42%	43%	47%	49%	50%
Education	Deg/Hghr QI	24%	23%	22%	37%	35%	34%
	A Level/equiv	13%	13%	12%	8%	8%	9%
	O Level/equiv	34%	35%	36%	35%	36%	35%
	CSE/equiv	11%	11%	11%	6%	6%	6%
	Other/none	18%	19%	19%	15%	15%	16%
Illness	Yes	38%	38%	39%	46%	47%	47%
	No	62%	62%	61%	54%	53%	53%

Table 4.2: Characteristics of adults missed by shorter scales in UK

		Missing		
		Poor UK	:	Missing:
		22 item	11 item	6 item
Gender	Male	45%	44%	45%
	Female	55%	56%	55%
Age	18-24	16%	12%	18%
	25-34	23%	18%	20%
	35-44	22%	20%	24%
	45-54	18%	18%	15%
	55-64	11%	11%	9%
	65-79	7%	17%	10%
	80+	2%	5%	3%
Ethnicity	White	87%	85%	85%
	Asian	6%	9%	9%
	Other	7%	6%	6%
HHld type	Pensioner	13%	24%	15%
	Single/cpl	28%	22%	22%
	Cpld+ch	33%	31%	38%
	LP	9%	2%	3%
	3+ch	7%	8%	8%
	3+ ads	9%	13%	13%
Emplt status	Emplt/SE FT	40%	42%	48%
	Emplt/SE PT	13%	20%	14%
	Unemp	12%	5%	8%
	Inactive	35%	32%	30%
NS-SEC	Mgrl/prof	26%	24%	28%
	Intermed	19%	30%	20%
	Small emplr etc.	7%	8%	8%
	Lower supervis	6%	3%	6%
	Semi/Routine	42%	34%	37%
Education	Deg/Hghr Ql	24%	48%	31%
	A Level/equiv	13%	10%	15%
	O Level/equiv	34%	22%	28%
	CSE/equiv	11%	5%	10%
	Other/none	18%	14%	15%
Illness	Yes	38%	38%	34%

No

62%

62%

66%

|

Notes: Number of cases: 2595, 118 and 483

Figure 4.1: Poverty rates for poor/non-poor – 11-item UK scale vs full scale

Figure 4.2: Poverty rates for poor/non-poor – 6-item UK scale vs full scale

5. Further examination of FRS/HBAI measure

It is clear from the examination of the PSE scales for adults and for children that, when it comes to distinguishing the broad groups of poor and non-poor (at the 3+ and 2+ thresholds), a relatively small number of items do the great majority of the work in the measure. These are items which are more commonly lacked. We have also seen that some of the items in the FRS measure are ones which do not make it into our reduced scales, including at least one item recently added into the FRS measure (fruit and vegetables for children). This prompts us to take a closer look at the items chosen for the FRS scale.

To explore whether the collection of items chosen is really an effective scale, we apply the backwards selection procedure which proved most effective above. Using PSE data, we replicate the FRS scale i.e. the 21 items in the FRS/HBAI material deprivation list⁶. We use the prevalence weights from the 2011/12 FRS (DWP 2013, p276) and the HBAI threshold (a score of 25 or greater, out of a possible 100). With the PSE data, 22 per cent are materially deprived on this measure. This compares with 12 per cent of children who were materially deprived *and* had a household income below 70 per cent of the median (DWP 2013, p106). We remove items from the FRS scale one at a time and recalculate the score to see which ones contribute least to the measure. Table 5.1 and Figure 5.1 shows the results.

Five items can be dropped from the FRS measure and it would result in fewer than 1 per cent of poor children being missed, compared with the full scale. These items include warm coat and fresh fruit and vegetables, two of the four items *added* in 2010/11. The third of the four new items is ranked 15 out of the 22 so it too contributes very little to the measure. The fourth item - keeping up with bills – does play a significant role.

Holidays for adults is one of the top 7 items. This lacked popular support in McKay's (2011) survey but was recommended for retention on the grounds that its removal would lead to too much discontinuity since so many households lacked it. The analysis here suggests that it plays a very important role in the overall measure. It is this which justifies its retention.

Of the full set of 21 items, just 12 items determine almost 90 per cent of the cases identified as poor. All nine of the adult or household items are in the top 12 but just three of the 12 child items make it into this group. In the updating process, more child items may have been included but the measure remains heavily dominated by adult or household items. 'Holidays' plays a particularly strong role. In spite of the lower prevalence weights, both adult and child versions of this question appear in the top 7. A household lacking both of these (25 per cent of children) scores just over 7 points – more than a household lacking a warm winter coat or celebrations on special occasions (both below 5 per cent lacking).

⁶ For the item which is not a PSE necessity – keeping up with bills etc. – we use the question 'commit'

Table 5.1: FRS/HBAI – backwards selection

Items in measure	Least valuable item	% of HBAI poor captured
21	ccelebhh2	100%
20	ccoathh2	100%
19	cschoolhh2	100%
18	cveggh2	100%
17	cplaygrphh2	99%
16	csnackhh2	98%
15	cclubshh2	96%
14	cgardenhh2	94%
13	cleisurehh2	92%
12	heatingchh2	89%
11	chobbyhh2	85%
10	cbedroomhh2	81%
9	commitchh2	73%
8	insurancehh2	62%
7		45%

Notes: Highlighted = items added in 2010/11. The seven most important items are (in descending order of lacking through affordability): furniture, savings, electrical goods, money for self, holiday (adult), decoration, and holiday (child).

Figure 5.1: FRS/HBAI – backwards selection

We have tested the contribution of each item using prevalence weights from the HBAI but data from the PSE. There is reasonably close agreement between the two datasets on prevalence but also some variations (Figure 5.2). In general, the PSE has a number of items where the proportion that has the item is much greater, i.e. there appears to be more deprivation on these items on the HBAI. These items include: play group, children's clubs or activities, friends round once a fortnight, and child hobby or leisure activity (circled on figure).

If we plot the order of items in the measure by their prevalence on the PSE survey, there is a clear relationship as before (Figure 5.3). The relationship between order and prevalence is somewhat weaker if we use the HBAI prevalence although it remains clear; the circled items are those where differences in prevalence are greatest between the two surveys. There is some suggestion therefore that, if we had used the FRS data, these four items would have played a stronger role in the measure, and all would probably featured in the top 12 (only one does at present). The other items of low importance in the measure (i.e. high order number) have a similar prevalence in both surveys, however, and they are likely to remain of very marginal importance to the measure even if we repeat the analysis with FRS data. These include two of the four new items (coat and fruit/veg).

Figure 5.2: Prevalence (% have, etc.) – PSE vs HBAI 2011/12

Figure 5.3: Order in the measure vs prevalence

6. Summary and recommendations

The analysis shows that it is possible to use a reduced set of the necessities items from the PSE to accurately identify adults and children regarded as deprived on the full measure. Using UK data, we can devise two scales of 11 items each which capture 95 per cent of UK poor adults (3+ threshold) and 95 per cent of UK poor children (2+ threshold) (Table 6.1). This measure works just as well, if not better, when used to capture the Scots poor (96 and 95 per cent respectively). If we devise scales specifically for use in Scotland, they perform just the same overall. In the case of the adult scale, this is because it contains exactly the same set of items. In the case of the child scale, there are three differences in the list of 11 items but they make no difference to the overall fit. On balance, there is a reasonable case for using a standard measure built from the analysis of UK-wide data in all contexts but it would also be understandable if some users chose to adopt the Scots-based measure for a survey focussed solely on Scotland.

The scales are constructed by identifying the set of items which best identifies deprived adults or children using the main thresholds (approximately the most deprived third). However, the reduced scales are very good at identifying more highly deprived groups. There is a very high correlation between the reduced scales and the full sets for both adults and children. They identify the most deprived 15 per cent with almost as much accuracy as they identify the most deprived third. Beyond this level, there is a fairly rapid decline in accuracy. If we use the higher thresholds to construct reduced scales in the first place, we end up with almost exactly the same set of items.

The analysis also shows that it might be possible for some purposes to use very short scales with six items each for adults and children although errors will be considerably greater and these should almost certainly only be used to identify the broader groups. The measures for both adults and children would be the same for the UK and Scotland. There is significant loss of accuracy here and we would not recommend these scales for widespread use.

There is a very slight bias in these reduced (11-item) scales; the people they miss are slightly more likely to be older, in work, in intermediate occupations and with a degree, and they are less deprived than average for people regarded as poor on the full measure. Overall, however, the groups captured by these scales are very similar to the group of people identified as poor on the full measure.

Table 6.1: Comparison of UK- and Scots-based measures

Basis	Number of items	Adults		Children	
		UK poor	Scots poor	UK poor	Scots poor
		UK-based	6	81%	86%
	11	95%	96%	95%	95%
Scots-based	6	n/a	86%	n/a	90%
	11	n/a	96%	n/a	95%

A responsive scale

The work also provides the basis for developing a responsive scale – one where the number of questions asked depends on answers to the initial set. A simple version of this would begin by asking about lack on the six item scale. Respondents with no deprivations on this group (and perhaps those with only one or two) would not then be asked any further questions. Those with two or three deprivations (or more) would be asked the next block of questions and a further cut-off would be applied to decide who was asked to answer any additional questions.

Given the large number of people who report no deprivations or only one on the full PSE scale, this could result in considerable efficiencies with almost no loss of information. It would, however, probably require to be administered through CAPI (Computer-Assisted Personal Interviewing) rather than the sort card exercise which has been used in the PSE. This change in methodology would need to be carefully validated. With research on the necessities themselves, an experiment in Northern Ireland suggested that quite different views are obtained from the public about which items should be considered necessities when questions are asked by CAPI rather than sort card (Kelly et al 2012).

Recommendations on the FRS scale and wider deprivation measures

We would recommend that the DWP revisits the selection and weighting of items in the child material deprivation scale. It is clear that the reduced scales constructed on the basis of the PSE data are quite different to those used within the FRS. First, five of the 21 items in the FRS list are not considered necessities in the PSE. Second, of the remaining 16, five would not be included in the reduced measure for the UK. Around half of the items in the FRS scale do not therefore appear in our reduced scales. Only three of our top 6 adult items and only two of our top 6 child items appear in the revised FRS scale. On the other hand, one of the adult items dropped in the latest revision of the FRS measure is in our top 6 on that scale while two of the three child items added in the last revision do not appear in our top 11 on that scale.

In part, the lack of fit between the scales stems from the use of different datasets to test public opinion and, in the case of the FRS, a more relaxed use of the majority threshold as a cut-off. To maintain consistency over time, McKay (2011) argued for keeping some items even where public support on the most recent survey fell below 50 per cent. There is a lot of merit in this approach for devising a long-term measure. The PSE might consider whether, in future, a more rounded judgement on public opinion might be taken – although the clear downside of such an approach is that it weakens the credibility of the method and lays it open to accusations of subjective judgement and even ‘fixing’.

Apart from this, the analysis here suggests that part of the reason for the poor fit between the reduced PSE scale and the FRS scale is the use of questionable criteria for the inclusion of items in the FRS measure. First, adding items on the basis of domains in a short scale designed to divide the population into poor/non-poor appears inappropriate because items in some domains are only lacked by people with very high levels of deprivation. The most efficient reduced measures from the PSE do not give balanced coverage to different domains because, at the thresholds we are examining, only some domains matter. Second, adding items based on levels of public support beyond the majority threshold appears inappropriate for the same kind of reason. The items which attract the greatest support also tend to have the lowest prevalence and so again only tend to be lacked by people with high levels of

deprivation. They are not useful for distinguishing the broader group of poor from the non-poor and our tests show that they play very little role in the binary measure which the FRS scale is used to produce.

Other researchers interested in poverty but not in the most extreme levels of poverty (such as the poorest three or four percent) could also bear in mind that domain coverage may be an inappropriate criterion for identifying items for scales. Greater attention should be paid to identifying items with a spread of 'severity' around about the levels of deprivation which are of interest.

When we test the items in the FRS measure, we find that several of them play virtually no role at all in the identification of materially deprived children using the HBAI methodology. This includes two of the four recently-added items (warm coat and fruit and vegetables for children). Although child items make up the majority of the revised FRS scale (12 out of 21), most of these make only a very marginal contribution to identifying deprived children. Adult or household items dominate the measure.

One other part of the FRS methodology also appears inappropriate. The FRS uses prevalence weighting – giving extra weight to items which fewer people lack. This might make intuitive sense if lacking items were distributed more evenly across more and less deprived groups. In that situation, lacking an item which the great majority have might indicate a greater chance of being deprived. However, the analysis here shows that this is not the case. The only people who lack such items are much more deprived on average – they also lack several other items. As a result, these items which few people lack play little or no role in the measures since it is designed to distinguish broad poor and non-poor groups. By increasing the weight given to these items within the FRS, the weights for the other, more common items are reduced and it becomes harder for all people to reach the threshold score.

Table 6.2: Recommended short and very short scales – UK-based

	Short (11 item) scale	Very short (6 item) scale
Adult	<ul style="list-style-type: none"> • Could household afford unexpected, but necessary, expense of £500 • Regular savings (of at least £20) for rainy days • Enough money to replace/repair broken electrical goods • Regular payments into an occupational or private pension • Enough money to keep home in a decent state of decoration • All recommended dental work/treatment • Damp-free home • Taking part in sport/exercise activities or classes • Home Insurance • A hobby or leisure activity. • Appropriate clothes for job interviews 	<ul style="list-style-type: none"> • Could household afford unexpected, but necessary, expense of £500 • Regular savings (of at least £20) for rainy days • Enough money to replace/repair broken electrical goods • Regular payments into an occupational or private pension • Enough money to keep home in a decent state of decoration • All recommended dental work/treatment
Children	<ul style="list-style-type: none"> • Money to save • A holiday away from home at least one week a year • Day trips with family once a month • Pocket money • Enough bedrooms for every 10+ of diff sex to have own • Computer and internet for homework • A suitable place at home to study or do homework • Garden or outdoor space nearby where can play safely • Going on a school trip at least once a term • Children’s clubs or activities e.g. drama, football • Toddler group, etc. at least once a week (pre-school) 	<ul style="list-style-type: none"> • Money to save • A holiday away from home at least one week a year • Day trips with family once a month • Pocket money • Enough bedrooms for every 10+ of diff sex to have own • Computer and internet for homework

Table 6.3: Alternative short and very short scales – Scotland-based

	Short (11 item) scale	Very short (6 item) scale
Adult	<ul style="list-style-type: none"> • Could household afford unexpected, but necessary, expense of £500 • Regular savings (of at least £20) for rainy days • Enough money to replace/repair broken electrical goods • Regular payments into an occupational or private pension • All recommended dental work/treatment • Enough money to keep home in a decent state of decoration • Taking part in sport/exercise activities or classes • A hobby or leisure activity. • Damp-free home • Appropriate clothes for job interviews • Home Insurance 	<ul style="list-style-type: none"> • Could household afford unexpected, but necessary, expense of £500 • Regular savings (of at least £20) for rainy days • Enough money to replace/repair broken electrical goods • Regular payments into an occupational or private pension • All recommended dental work/treatment • Enough money to keep home in a decent state of decoration
Children	<ul style="list-style-type: none"> • Money to save • A holiday away from home at least one week a year • Enough bedrooms for every 10+ of diff sex to have own • Day trips with family once a month • Computer and internet for homework • Pocket money • Toddler group, etc. at least once a week (pre-school) • A warm winter coat • At least four pairs of trousers, leggings, jeans etc. • Garden or outdoor space nearby where can play safely • Some new, not second-hand clothes 	<ul style="list-style-type: none"> • Money to save • A holiday away from home at least one week a year • Enough bedrooms for every 10+ of diff sex to have own • Day trips with family once a month • Computer and internet for homework • Pocket money

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Appendix 1: Topics already covered by the SHS

For the Scottish Government, an additional reason for adopting an alternative measure in the SHS is that the existing survey questions could provide useful information, so the deprivation scale could be kept to a minimum. The SHS already includes several questions on aspects of consumption or living standards (Table A1.1). However, only four of these are items which are included in the new PSE deprivation scale: bedrooms, insurance, damp-free home and heating.

The SHS asks whether the household has an internet connection. It also asks the random adult where and how they access the internet for personal use, with ‘at home’ and ‘personal computer’ possible responses in each case but many other possibilities also included (through smart-phone, in libraries, at work, and so on). These do appear to give better information than the necessities questions asked in the PSE but, in the end, neither computer nor internet made it into the PSE set of adult items due to lack of public support. The PSE child items do include computer and internet access but this is for the child and the SHS does not ask about what is available for them.

Car ownership did not get majority support in the PSE as a necessity. Although it is included in the SHS (lacking/not), its use as a deprivation indicator would be problematic, especially in the context of comparisons between local authorities, due to the probable urban-rural differences. Many people on low incomes in rural areas will make substantial sacrifices in order to run a car (Scottish Affairs Select Committee 2000). There is information in the PSE on whether households are keeping up with bills and it is now included in the FRS deprivation scale, but it is not in the PSE necessities items.

Table A1.1: Potential deprivation scale items on SHS

Item	Affordability on SHS	FRS	PSE
Enough bedrooms		Yes	Yes
Contents insurance		Yes	Yes
Keeping up with bills and debt payments		Yes	
Car			
Damp-free home			Yes
Home computer	Yes		
Internet access	Yes		
Adequate heating	Yes	Yes	Yes

Notes: ‘FRS’ - item included in the revised FRS set. ‘PSE’ - item is part of the full PSE adult deprivation measure. Table A1.2 below provides details of the SHS questions.

Another issue with the existing SHS questions is the possible responses to the questions. While all of the SHS questions record whether people have particular items or not, only three identify those who lack the item due to affordability – and only one of these is part of the PSE scale (heating). Since the work of Mack and Lansley (1985), the PSE approach has always been to measure deprivation in terms of people who lack items due to affordability, and not through choice. McKay (2004) has suggested that an index based simply on having or lacking an item (ignoring choice) may work as well as the PSE approach. That might provide grounds for including these other measures from the SHS in the deprivation measure.

The main argument against this is that it will lead to a confusing, hybrid kind of measure. Part of the attraction of the consensual deprivation measure of the PSE is its relative simplicity and hence transparency: it is based on items which the majority of the population believe are necessities, and it identifies people who lack these things not from choice but through being unable to afford them. It should also be noted that McKay's argument does not justify combining different kinds of measure in this way.

There can be a considerable difference between the proportion of people who lack an item, and the proportion who say they lack it due to affordability. On contents insurance, for example, the PSE survey shows 20 per cent lack this but only 12 per cent say this is due to affordability. On damp-free home, the figures are 17 and 10 per cent and on sufficient bedrooms, they are 16 and 8 per cent. We would need to be quite wary about including these items measured solely as lacking/not in a measure which has been calibrated on the basis of questions about lacking due to affordability.

We should acknowledge that the PSE deprivation measure already includes one question not in the standard necessities format – the ability to afford a one-off expenditure of £500. This is answered as a yes/no question. In effect, the negative answer is treated as 'lack, unable to afford' on the basis that everyone can reasonably be expected want to be able to afford this.

On balance, it seems that there would need to be a very good case for mixing different types of measure and/or it would need to be done on a very selective basis. In addition, there will be people who will want to use a reduced scale in different surveys so we should not take any additional information for granted. In the analysis that follows, we do examine whether adding in additional information from these SHS questions might strengthen any measure but only after we have developed the reduced scale.

Table A1.2: SHS questions

Item	SHS questions
Household contents insurance	“Do you have contents insurance? Yes/no”
Do you keep up with bills and regular debt payments	SHS has a financial management question set which could be used as an alternative.
Car	SHS asks about all private and commercial vehicles so could be derived.
Damp-free home	<p>SHS asks about the house “Are you dissatisfied with ...” Dampness is included in the option list. Also asks if heating is too expensive. Also asks</p> <p>DO YOU HAVE ANY OF THESE PROBLEMS IN YOUR HOME AS A RESULT OF CONDENSATION OR DAMP?</p> <p>A Steamed up windows [1] B Steamed/ Wet walls [2] C Damage to paint [3] D Carpet mould [4] E Wall mould [5] F Staining to walls [6] Other [7] None [8] Don't know [9]</p> <p>WHICH OF THESE BEST DESCRIBES THE MOULD, WHEN THE MOULD IS AT ITS WORST ... READ OUT</p> <p>Small spots [1] or Hand sized patches [2] or Larger patches</p> <p>IS/ARE THE PROBLEMS OF MOULD ALL THE YEAR ROUND, OR ONLY IN THE WINTER?</p> <p>All year [1] Winter only [2] Other (WRITE in) [3] Don't know</p>

<p>Home computer AND Internet connection at home</p>	<p>SHS 2012 asks “Do you currently have access to the internet?”. If so, HOW DOES YOUR HOUSEHOLD CONNECT TO THE INTERNET? INSTRUCTION TO INTERVIEWER: ONLY INTERESTED IN HOW YOU CONNECT TO THE INTERNET, NOT INTERNET PROVIDER A broadband connection like BT broadband, Virgin or Sky [1] A dial-up connection through a phone line [2] A USB dongle or connection through a mobile phone/smartphone [3] Other (specify) [4] Don't know The random adult is asked: WHERE DO YOU ACCESS THE INTERNET FOR YOUR OWN PERSONAL USE? A - At home [1/0] B - At another person's home [1/0] C - At work [1/0] D - School, college, university, other educational institution [1/0] E - A government/council office [1/0] F - Community or voluntary centre/organisation [1/0] G - Internet café or shop [1/0] H - Mobile phone/WAP/on the move [1/0] I - Public library [1/0] J - Somewhere else [1/0] AND WHAT METHODS DO YOU USE TO ACCESS THE INTERNET FOR YOUR OWN PERSONAL USE THESE DAYS? A - A personal computer or laptop [1/0] B - Digital, cable or satellite television [1/0] C - Mobile phone /iPhone/ Smartphone [1/0] D - A games console / PS2 / xBox [1/0] E – A tablet – iPad/Playbook or similar [1/0] F – Another way For adults who do not use the internet, options of “I can't afford a computer” and “internet access would be too expensive”</p>
<p>Heating to keep home adequately warm</p>	<p>SHS includes a detailed question set on home heating and fuel bills. Specifically asks “Can't afford to heat the house” as one of the options on “Which of these things make it difficult to heat your home?” Also asks DURING THE WINTER MONTHS, DO YOU GENERALLY FIND THAT YOUR HEATING KEEPS YOU WARM ENOUGH AT HOME, OR NOT? Yes, always [1] Only some of the time [2] No, never [3] Don't know [4] HOW MUCH OF A PROBLEM IS THIS, IF AT ALL, TO YOU? A serious problem [1] A bit of a problem [2] Not very much of a problem [3] Not a problem [4]</p>