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Assessing the Adult Wellbeing Topical Module in the Survey of Income and Program Participation (SIPP)

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Abstract

In 1990 the U.S. Census Bureau began to investigate the possibility of including a module of questions covering indicators of material wellbeing and quality of life. In this effort, sets of questions were 'borrowed' from other surveys on a list of topics. These questions were first fielded in the Survey of Income and Program Participation (SIPP) in 1992. Despite the effort that was put into creating these measures, little is known about their relationships to one another and most research using these data employed ad hoc selections of variables, with no clear evidence that any particular combination provides a valid measure of material wellbeing. This study examines the use of similar types of data in work outside the U.S. and describes differences in the data collected. The study then uses factor analysis and structural equation modeling to ascertain the relation of a number of questions in the current questionnaire both to each other and the general concept of interest. Comparisons are made to results in other similar analyses.

Most research on material wellbeing has started from one of two places. Either there is a strong interest in a single aspect of wellbeing, such as lack of food or access to health care services, or researchers examine a set of indicators taken at once, in an attempt to measure something broader, which we will call *Wellbeing*. Clearly these two types of concerns are related, in that single aspects are components of the larger measure of which they form a part. However, they are also distinct in that single aspects each have their own antecedents and consequences. Take health care. Some researchers may be concerned with the lack of access to health care associated with low resources, poverty and related factors. On the other hand, some researchers are simply interested in whether or not health care was received. For example, if a millionaire skips a doctor's check-up because she is too busy, while another person skips seeing the doctor because she doesn't have health insurance, the concern for certain researchers concerned about health care is the same. A doctor's visit was foregone, the opportunity to diagnose a problem was missed. In this case, we can say the researcher is purely interested in the single indicator.

In the case where the concern is more general, the question is at least partially about a lack of resources that leads to difficulty meeting basic needs. The lack of resources that makes it difficult to see a doctor also, presumably, makes other things difficult as well – whether it be paying bills, affording basic appliances or living in a desirable neighborhood. Because individuals may respond to a lack of resources in different ways, the work in this paper presumes a concern with the question of access to resources as it relates to hardships in general experienced by people and families.

Now, if the interest is not strictly in the individual component but in the general lack of resources, why not measure the resources directly, as is done with income-based poverty measures? One argument is that it is not lack of resources but the consequences of this lack that are of interest from a research and policy perspective. For example, Mayer and Jencks (1989) cite the relative popularity of in-kind over cash transfer programs in the United States as evidence that citizens are more concerned about helping the poor have adequate health care, food and shelter than making sure their income is at a given level.

From a measurement point of view, this points to using indicators that are as close as possible to ultimate outcomes that we care about, such as hunger, cold, ill-health, and so on. At the same time, it points to limiting the concern to situations brought on by lack of resources rather than by other causes – for example, hunger caused by lack of money, not dieting. This concept is described succinctly by Mack and

Lansley (1985) as "enforced lack of socially-perceived necessities."

Following the 1989 study by Mayer and Jencks on material hardship in the U.S., the Census Bureau began to investigate the possibility of including a module of questions covering reports of material wellbeing and quality of life. This was included in the SIPP because it already measured important details of the economic circumstances of people. Some characterized the SIPP as measuring the inputs but not outcomes although some non-income indicators in the SIPP were employed to measure material wellbeing (Radbill and Short, 1992.)

Initially the idea was to include questions on satisfaction, consumption expenditures, housing costs, conditions, and energy usage and ownership of consumer durables. An interagency group was formed to study the creation of this module. In an effort to prepare this module easily, sets of questions were 'borrowed' from other surveys on a list of topics. Those surveys included the American Housing Survey, the National Crime Survey, the Income Survey Development Program (the precursor to the SIPP), the Consumer Expenditure Survey, a Statistics Canada survey that included questions on minimum income, the Wisconsin Basic Needs Survey, and two surveys of Chicago residents conducted by the Center for Urban Affairs and Policy Research at Northwestern University (Cook et al., 1984, Cook et al., 1986.)

The purpose of the module was to ascertain material quality of life. The dimensions chosen were focused on the material conditions of people's lives such as ownership of consumer durables, housing quality, neighborhood quality, diet adequacy, perceived access to medical care, expenditures for current consumption and the existence of informal support networks.[1] The stated purpose of this module was to allow assessments about current living standards or material wellbeing. While noting that the SIPP already did an excellent job at measuring income, health, and health care utilization this module might further address questions such as:

- To what extent are people who appear poor in terms of income relatively deprived in levels of living. Conversely, to what extent do people who do not appear poor in traditional terms experience relatively low levels of living?

- Are there important differences in level of living among people at the same nominal income level?

- Do the young and old fare equally in living conditions at the same income level?

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[1] Internal Census Bureau memorandum from Larry Radbill to Chester Bowie, 'Proposed variable topical module for 1990 SIPP wave 6. July 18 1990.

In the work of the interagency committee on what became the "adult wellbeing topical module" (there was a separate section for children), other decisions were made. The household would be the unit of data collection to minimize respondent burden. The focus of the questions would be on the presence or absence of numerous 'semi objective' indicators, not an evaluation of the condition or age to minimize the collection of 'subjective' data. Overall, the collection of questions was guided by a general idea of material wellbeing and the availability of questions already employed in household surveys on the general topic. No further information guided this collection of questions. Moreover, over the years, the set of questions has changed very little.

At this same time, interest in 'direct' and multidimensional measures of wellbeing increased outside the U.S., following on the initial work of Townsend on social exclusion (Atkinson, et al., 2002, Callan et al., 1993, Gordon et al., 2000, Hallerod, 1995, Muffels et al., 1992, Nolan and Whelan 1996 b, Piachaud, 1987, Ringen, 1988, Saunders, 1997, Van den Bosch, 2001). After first taking note of these studies, this paper attempts to understand in a comprehensive way, the concept behind the broad set of indicators included in this extensive set of questions and studied generally by others.

As funding for the SIPP survey became somewhat uncertain, there was interest in evaluating the questions in this module as to their purpose, with the goal of eliminating unnecessary items and, in that process, establishing a mechanism by which questions are reviewed and updated systematically over time. Unlike questions about income, direct questions about material wellbeing must change on a regular basis. The first task, it seemed, was to more formally conceptualize what we are trying to measure and we describe that process here. For this study we treat 'material quality of life', or ***Wellbeing,*** as unobservable, with responses to individual items in the questionnaire as partial indicators of a more general state.

Background

In 1991, Mayer followed up her work with Jencks with an examination of living conditions among the poor in four rich countries. In this work Mayer made comparisons of the distribution of housing conditions, consumer durables, health, and visits to the doctor and dentist finding that low income Americans had similar living conditions to low income families in Canada, Sweden, and Germany. As

noted by Mayer, work on this topic had already been done in Europe. These studies focused on social exclusion, rather than material hardship, and as such included questions about social statuses and behaviors. There much of the literature followed the ideas of Townsend (1979) who said in his book, *Poverty in the United Kingdom*, that, "Living standards depend on the total contribution of not one but several systems distributing resources directly and indirectly to individuals, families, workgroups, and communities."

In his book, Townsend developed a deprivation index that summarized responses to questions about lack of food, refrigerators, indoor baths, and holidays, and other items based on prevalence of each item in the population. Mack and Lansley (1985) conducted the *Breadline Britain* survey in the 1980s to update the work of Townsend. Their measures included questions about the lack of a large set of items. They also asked whether or not this item would be considered a *necessity* and referred to theirs as a consensual approach to defining minimum standards. The items they considered were those that most respondents agreed were necessities.

Using Irish data, Callan, Nolan, and Whelan (1993) defined poverty as 'exclusion arising from lack of resources (p. 142). In that paper, the authors considered a set of items or activities that could be characterized as socially-defined necessities. The data consisted of a list of 20 items or activities, including durable goods such as refrigerators and telephones, housing conditions, and social activities. The authors used factor analysis to systematically examine the dimensions of deprivation and to see whether the items clustered into distinct groups. This analysis resulted in three clusters or groupings that the authors termed as basic lifestyle, housing and durables, and an *other* category.

In this work, the authors suggested that it is useful to distinguish these three dimensions, rather than simply aggregating across all of the 20 items into a summary index. They then proceeded to focus only on one dimension, the first group defined as basic lifestyle needs from which they constructed a 'basic deprivation index' based on the eight items in this cluster by assigning a weight of one to each item. These items were

1. Having second-hand clothes
2. Not having a warm coat
3. No roast or equivalent
4. Not having a meal with meat, fish etc. every second day
5. Less than two pairs of shoes
6. Debt

7. Do without main meal
8. Do without heat

These eight items formed the basis of the measure of deprivation that was employed by the authors without the other two remaining dimensions. They noted that the factor analysis suggested that housing problems and basic deprivation are 'quite frequently experienced by different types of households and that households experiencing a lack of one or more housing items have a distinctive demographic and geographic profile compared to those with basic deprivation (p. 168).' In concluding, the authors stated that "…appropriate measures of deprivation will change over time and vary across countries if the objective is to reflect exclusion, and thus what is not included is, in a sense as significant as what is included." (pp. 168-169.)

Nolan and Whelan (1996b) in re-estimating the three factor model discussed above, note five significant challenges posed by these measures –

1. How to select items suitable
2. How to take account of tastes
3. How to aggregate items into a summary index
4. How to select a cut-off or threshold
5. How to elucidate the ways in which the observed deprivation/income pattern comes about

More recently, a group of researchers at the United Kingdom Department for Work and Pensions (Mckay and Collard, 2003) tackled the first problem in the above list, selection of suitable items under serious constraints. Using the Family Resource Survey they had only room for about 10 questions. They wanted to measure deprivation instead of consumer durables. The goal was to identify as 'deprived' most of the same people that would be identified as such with a longer battery of questions. They explored dimensions of deprivation using factor analysis, as they note, a useful tool for exploring the underlying structure of data. Using data from several surveys exploratory factor analysis was carried out. Four factors were identified: food, clothing, durables, and social activities. These researchers could not distinguish a factor such as the 'basic deprivation' used by the Irish studies. This study described a series of analyses to identify a small number of underlying dimensions of deprivation. Some common dimensions were identified. They found that one important element was how people reported managing financially and that debt seemed to be an underlying dimension separate from other forms of deprivation. The final set of questions settled on by this group is shown in the appendix.

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This study by McKay and Collard had similar goals as our task here. There are some important differences. It is notable that the UK set of questions includes social aspects of wellbeing, whereas, the questions in the SIPP are strictly related to material aspects of wellbeing. Also, it is important to note that questions about enforced lack are not available on our survey. However, one goal of this study is similar to the work of Mckay and Collard in attempting to address the first challenge in the above list, selecting appropriate items for data collection. To this purpose we employ factor analysis, as in the three previous studies.

Data and methods

This research makes use of the 1996 panel of the Survey of Income and Program Participation (SIPP) (U.S. Census Bureau, 2001). This panel started with 36,780 interviewed households in April 1996, and continued interviews every four months through March of 2000. Each interview consisted of a core interview, with standard questions on demographics, labor force and income, and a topical module interview, with questions on topics that changed from one interview (wave) to the next.

The eighth wave of the 1996 panel, in the field in August through November of 1998, contained a topical module on "adult wellbeing." This was an extensive battery of questions on consumer durables, housing conditions, crime and safety, neighborhood conditions, community services, ability to meet basic needs, ability to get help when in need, and food security.

The questions on consumer durables asked whether a household possessed, in working condition, each of the following items: clothes washer and dryer, refrigerator, stove, dishwasher, microwave, air conditioner, color television, VCR, computer, telephone or cell phone.

Housing conditions included an assessment of the general state of repair of the home along with specific items such as plumbing, roof, and windows. Respondents were also asked about number of rooms, the comfort of their homes, and whether they would like to move.

Fear of crime was measured by answers to questions about fear of leaving the home and feeling safe in the home. Neighborhood conditions included street noise, streets in need of repair, litter in the streets, rundown or abandoned buildings, industrial or other nonresidential uses, and smoke or fumes. Community services evaluated by respondents included police and fire protection, health care services,

public transportation and schools. Respondents were also asked if they would like to move because of bad neighborhood conditions or poor community services.

Questions on difficulty meeting basic needs were very similar to those used by Mayer and Jencks in their analysis of poverty and material hardship in Chicago (Cook et al., 1986, Mayer and Jencks, 1989). Household heads were asked, "During the past 12 months, has there been a time when your household did not meet its essential expenses? By essential expenses, I mean things like the mortgage or rent payment, utility bills, or important medical care." They were then asked about instances when the household did not pay the full amount of rent or mortgage, did not pay the full amount of utility bills, had telephone service cut off due to nonpayment. Next, they were asked if someone had needed to go to the doctor or hospital but did not go, and if someone had needed to see a dentist but did not go. The last section had several questions taken from the food security questionnaire developed by the U.S. Department of Agriculture.

Again, it is important to note some important differences with the questions in the SIPP compared with those employed by Mack and Lansley and others. One is that there is no attempt in the SIPP to determine whether the lack of certain item is due to tastes or constraints. If respondents indicate for example that they do not have a telephone, there are no follow up questions. It is impossible to determine with these data whether or not the respondent didn't want or couldn't afford a telephone. Secondly, there are not attempts to ascertain whether or not respondents believe an item to be a necessity or not, thus consensual measures are not possible with these data. Finally, the list of questions was limited to material conditions of living and no questions about social inclusion occur in the survey. These differences represent important impediments to comparisons of these results to those undertaken elsewhere. These data from the SIPP have contributed to a number of studies on material wellbeing in the U.S. (Bauman, 1999 and 2002; Beverly, 2000 and 2001; Boushey et al., 2001; Federman et al., 1996; Iceland and Bauman, forthcoming; Mirowsky and Ross, 1999; Ouellette et al., 2004).

Analyses in this paper proceed in several stages. First, given that previous research had not examined the dimensionality or appropriate measurement model for the item set, analyses explored the dimensional structure and fit of several models in a sample of 5,000 individuals randomly selected from the full sample. Second, based on the exploratory findings, the fit of a congeneric five factor model, with a single higher order factor was cross-validated in the full sample. Mplus (Muthén & Muthén, 2006) was

used for all analyses. Fit assessment focused on close-fit indices and followed guidelines suggested by Hu and Bentler (1999), Muthén and Muthén (2006), and Cheung and Rensvold (2002). Misfit was considered when the majority of indices suggested poor fit. In all analyses, the WLSMV estimator, a robust estimator appropriate for categorical data (Muthén & Muthén, 2006), was used. Consistent with arguments for more stringent error control in model tests of this type (Green & Babyak, 1997; Thissen, Steinberg, & Wainer, 1993), an α of 0.01 was adopted.

To establish dimensionality, confirmatory factor analysis for ordered-categorical measures (CFA-OCM), an extension of the more familiar CFA for continuous measures (CFA-CM), was used. CFA-OCM indicates a set of equations to describe the relations among a set of ordered-categorical items, suggesting that individuals' item responses are determined by their value on an underlying factor or factors and several measurement parameters, *e.g.*, intercepts, loadings, thresholds, and uniquenesses. Mplus uses probit regression to estimate item correlations via the marginal and bivariate item distributions (Muthén & Muthén, 2006) and these correlations are then used in a manner similar to CFA for continuous measures. For detailed descriptions of CFA-OCM, the reader is referred to Millsap and Yun-Tein (2004).

Several models were tested before arriving at a five factor model; these included a single factor model, a two factor model, a three factor model, and a four factor model. The models were exploratory, allowing all items to load on each factor, examined correlations among the factors, *.e.g.*, orthogonal vs. oblique rotation, and included on the constraints necessary for statistical identification (Millsap, 2001). Space constraints limit the presentation of results for each model. However, none of the exploratory models' fit indices met the adopted criteria, *e.g.,* RMSEA < 0.05 and SRMR < 0.08, and the models were rejected. Analyses initially stopped when fit indices reached criteria. This model was a five factor model that suggested the items fell into five groups that generally measured 1) consumer durables, 2) resources available to meet needs, 3) housing conditions, 4) neighborhood problems and crime, and 5) community services.

Before adopting this as the final model, analyses examined some additional models. First, the fit of a simpler, more constrained, congeneric factor model that allowed each of the items that loaded most highly on a given factor to load only on that factor was tested. Fit indices for this model suggested that this model provided good fit to the data. Two item's communalities (DOG and TRAN) were less than 0.1

suggesting that responses to these items were not well predicted from the consumer durable factor and that they were not adequate measures of the factor. These items were dropped from the model (McDonald, 1999), and the model was rerun. This model demonstrated good fit as well.

Finally, the fit of a higher-order model, that included a single second-order factor model was tested. This model retained the congeneric constraints, allowed the five factors to correlate, and suggested that, although the items measured separate constructs, a single underlying construct, we will call *Wellbeing*, accounted for variance among the five factors. Again, this model provided good fit to the data (RMSEA = 0.05, CFI > 0.88, TLI > 0.95, and gamma hat = 0.95). Analyses then cross-validated this measurement model in the full sample. The model fit the data well, and CFA-OCM stopped, adopting a congeneric five-factor correlated model with a single higher-order factor as the final model.

Discussion of Results

The purpose of the first stage of the analysis was to explore the measurement properties of all available items. The exploratory model served as a starting point for constructing the final model. In the exploratory model, we were interested in determining the minimum number of factors that would capture the item covariance while simultaneously providing adequate interpretation. Table 1 shows fit statistics for several models. Although no clear line of demarcation exists as we move from the simplest to the most complicated model, on statistical and substantive grounds, we chose the five factor model. This model yielded a root mean standardized error of estimate under .05, which is often taken as a criterion for adequate fit in exploratory models (Bollen, 1989). Importantly, the factor loadings from this model yielded a pattern with unambiguous association of substantively related factors onto the five factors.

The factor loadings for the five factor exploratory model that allowed the factors to correlate are shown in Table 2. To make the pattern of loadings more readily apparent, only loadings of magnitude 0.2 or greater are shown. The first 13 items load strongly on the first factor, which we have chosen to label "consumer durables." The second factor identified in the exploratory model, labeled "resources available to meet needs," loads most strongly on factors related to paying bills, meeting expenses, food security and receiving help when in need. The third factor, "housing conditions," was related to indicators of housing repair and satisfaction with conditions in the home. The fourth factor, "neighborhood problems and crime" relates most strongly to the sixteen indicators of safety from crime, conditions in the neighborhood, and

satisfaction with neighborhood. Factor number 5, "community services," is related to four indicators of satisfaction with community services, such as police and fire.[2]

What is impressive from these results is the clarity and simplicity of these factor patterns from a statistical and substantive viewpoint. There were relatively few indicators with loadings of 0.2 or greater on more than one factor. Among consumer durables items, possession of an air conditioner also loads somewhat on the third "housing conditions" factor. RADPHON (telephone in household) as well as several of the food security indicators loaded on both the consumer durables factor and the second factor, "resources available to meet needs."   Several of the items loading primarily on the third factor, "housing conditions," also loaded on the second factor. Two indicators of safety from crime (EACSTAY and EACWITH) also loaded on this factor, as did an indicator reflecting overall satisfaction with neighborhood (EANSAT). Finally, the evaluation of whether public services in the neighborhood are bad enough that the respondent would like to move loaded on the fourth factor "neighborhood conditions and crime" as well as the fifth factor "community services."

From a substantive viewpoint, none of these multiple loadings are surprising or problematic. For example, the loading of air conditioning on consumer durables and housing probably relates to the fact that it is often purchased as a durable item, but also relates to living conditions in the home (especially to the ratings of comfort included among the housing items). Similar explanations can be given for the other items with multiple loadings.

The five factors identified in the preferred model are related to groups of items that share substantive similarities. Naming the factors was not challenging, and, in fact, followed closely the titles originally given to subsections of the questionnaire by the staff who developed it. We anticipated the potential appearance of methodological differences between items – as with the satisfaction-rating questions that appear in several subsections of the questionnaire. However none of these appeared as separate factors. In short, the factor patterns reflect straightforward, broadly recognized aspects of people's living situations.

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[2] Because RACWDOG, presence of a dog in the home, had a relatively low factor loading, and because it does not have a substantive interpretation as an indicator of material wellbeing, it was dropped from the model. EAPTRAN, an evaluation of public transportation, did not load on any factor and was also dropped from the model.

Table 3 shows standardized factor loadings and threshold values in our final confirmatory model. In building this model, we simply took the largest loading from the exploratory model to be the initial factor loading for each item in the confirmatory model (shown in bold in Table 2). The fit statistics and modification indexes supported a simple model with each indictor loading on one and only one of the five latent factors.

The items with the strongest loadings on the consumer durables factor – telephone, refrigerator, and washing machine – are within the realm of things that might be considered "necessities" rather than matters of choice. Dishwashers and washing machines have especially strong standardized loadings on this factor. This may be due to their being important labor-saving devices which, unlike stoves and refrigerators, have not become completely ubiquitous (stoves and refrigerators were each found in 99 percent of households in 1998). Electronic goods, such as color televisions, computers and cell phones, have slightly lower loadings on the factor.

The threshold values of items related to the consumer durables factor show where the divide between a positive and negative answer to an item falls. The CFA-OCM model assumes that underlying the dichotomous responses, a continuous latent response variate exists. At some point along this continuum, a response moves from no to yes. The threshold represents this point. The latent response variate is generally considered to be standard normal and the threshold value can be interpreted as a z-score. Large values indicate items that are "hard" to endorse and small values indicate items that are "easy" to endorse. In the current context, for example, lacking a telephone has a value of -2.54. This suggests that an individual would need to be quite low on the consumer durable factor before they do not have a telephone. The threshold values can be compared to each other as well, and the ordering of the values gives clues about the relative position of the items.

To clarify, start with the example of the first item "lack cell phone," which has a threshold value of 0.39. By comparison, lack of an air conditioner has a threshold value of -0.86 and lack of a telephone has a value -2.54. It appears that the latent variant reflects, at least partially, whether a particular lack is common, as with cell phones, or rare, as with telephones. A reasonable interpretation may be that threshold values reflect the level of resources within the household. For example, even relatively well-off households may decide they cannot afford the items with the highest threshold scores while a group of

items clustered at the low end – telephones, stoves, televisions, and refrigerators – are unaffordable for relatively fewer households.

The items loading most strongly on the second factor, "resources available to meet needs" are those that address basic needs most directly – meeting basic expenses, paying utility bills, obtaining sufficient healthful food, and paying the rent or mortgage.

In terms of threshold values, the highest were the dividing lines between having available "all" or "most" of hypothetically-needed help from community agencies, friends or family. At the other extreme was falling in the category of "often" not having enough food, being unable to afford balanced meals, or worrying that food would run out. Most of the indicators of basic needs not relating to food or help from others had very similar threshold values. This indicates that these items may not represent greater or lesser degrees of need, but rather different aspects of need that appear at approximately the same level.

The largest loadings on the "housing conditions" factor were those associated with ratings of home comfort and repair, followed closely by specific instances of repair problems. The lowest loadings were associated with problems with pests and roof leaks, which were among the most common specific repair problems mentioned.

The thresholds associated with this factor suggest that they are measuring the severity of problems with the home. The divides between being "somewhat satisfied" and "very satisfied" with home repair, warmth, coolness, furnishings, privacy and space were associated higher threshold values. The divides between being "somewhat dissatisfied" and "very dissatisfied" with these items were associated with some of the lowest values. Exposed wires and holes in the floor were other items with low threshold values, while problems with pests and roof leaks were much higher.

As with the housing factor, evaluative opinion items had strong loadings on the factor "neighborhood problems and crime." The lowest loadings were those for factual questions about physical conditions in the neighborhood, such as streets in need of repair, noise problems, smoke or pollution.

In terms of threshold values, the set of opinion items again set off the extremes, with the divide between "somewhat satisfied" and "very satisfied" associated with high values and the divide between "somewhat dissatisfied" and "very dissatisfied" associated with low values. In addition, households that indicated that conditions were bad enough that they would move were likely to fall very low. Many of the

other items marked a spot somewhere near the middle, although there was more differentiation between items on this scale than was the case for the group of basic needs items that fell between the extremes in that scale.

The last factor was "community services." Health services were slightly less strongly associated with this scale than the other three items. In terms of thresholds, the same divide in satisfaction levels is seen as with previous thresholds. It can be said, however, that dissatisfaction with police or fire services seems to be a more serious situation than dissatisfaction with health services or overall services.

The confirmatory model provided insight into the factors associated with this set of material wellbeing indicators, as well as the indicators themselves. The five factors have simple forms and fairly clear meanings. They all seem to relate to lack of resources or material deprivation, but each factor had to do with a particular topical area – housing, neighborhood, community services, consumer durables, basic needs, and item thresholds gave some indication of how well or poorly a family is doing when they endorse an item. In all these ways, the model provides a clear and straightforward picture of household wellbeing.

The similarity with the way that the five factors reflect the idea of resource constraints leads to the question whether there is a commonality between the factors along this dimension, *i.e.*, an underlying dimension of *Wellbeing*. We tested the addition of a second order factor and found that it improved the fit of the model significantly. Table 4 shows the relation between the second order factor and the five factors already described. The strongest relation involves the housing and neighborhood factors. The consumer durables and community services factors were less directly related to the second order factor, but still well predicted from the underlying factor. This was a little bit disappointing to us, as we expected the 'resources available to meet needs' indicator to be central to the idea of resource constraints that we were trying to capture. Instead, the factors most related to "housing and neighborhood" concepts are best predicted from an underlying concept of *Wellbeing*. What it may be indicating is that the most important resource constraints common to all these indicators are those that are longer-standing in nature. Basic needs indicators may be too influenced by temporary changes in circumstance to be at the center of this process.

There were some additional aspects of the model that require further exploration and thought. Opinion items seemed to work very well in defining these scales. By contrast, objective conditions

sometimes did not provide much variation in terms of thresholds. This is somewhat disappointing, in that an attraction to direct measurement of material **Wellbeing** is the ability to point to objective conditions of households rather than depend on indirect indicators or subjective judgments.

The relative lack of variation in threshold values among many of the items measuring objective conditions is a cause for concern if the objective is the ability to measure **Wellbeing** across a large part of the population, rather than simply divide households into groups. For example, the various indicators of housing repair problems fell in a fairly small range for the housing conditions factor. They seemed only to distinguish housing conditions at the low end – between adequate and terrible. The difference between comfortable and adequate housing was not captured by these items. To make this scale more useful, it might help to develop new items that make distinctions higher up the scale of housing quality. There are limits in pursuing this objective, however. The two repair items (problems with pests, roof leaks) that had the highest threshold values also had low factor loadings, indicating that they are subject to influences that lie outside the "housing conditions" factor being examined here. This same relationship also held for some of the other factors – most notably consumer durables, where items like cell phones, computers and food freezers were hypothesized to be influenced as much by taste as by resource constraints.

This study represents a first look at these data from this comprehensive perspective and many issues are yet to be resolved. Despite these issues, however, our analysis led us to two sets of conclusions. The first set has to do with finding a new perspective on this group of direct measures of material wellbeing. This study suggests that all of the questions, but a very few, taken together are important in the measure of **Wellbeing**. Picking arbitrarily only one of the factors may lead one to erroneous conclusions. The results from the higher order estimation suggest that choosing only one factor, such as a basic needs factor, leaves much in the variation of **Wellbeing** unexplained, and that not including housing and neighborhood factors are important omissions in understanding wellbeing generally. These results further suggest that owning items, such as those listed in the consumer durables factor, is less important overall to **Wellbeing** than the housing and neighborhood conditions of living that are described by these data.

The factors we found were very similar to those that appeared in the Irish and the UK studies. However, our results shed new light on their decision to study a single factor chosen from these. Their "basic deprivation index" seems most closely related to our "resources available to meet needs" index,

which turns out to have a weaker association with the central factor emerging from this research than factors relating to housing and neighborhood conditions. This finding suggests that taking one aspect out of context opens the possibility for inadvertent misunderstandings about the conditions that affect household living conditions. In particular, not enough is known about how time patterns of income and living situations enter into these factors (see Iceland and Bauman, forthcoming for an initial examination of this topic). Also, a focus on the 'lack of wellbeing' rather than 'overall wellbeing' more generally, is an important distinction between the approaches taken.

The second set of conclusions has to do with the survey instrument and data collection. While one of our main goals of this study was to refine the collection of items in the SIPP survey, we have only managed to eliminate two questions from the study as not useful. There are some indications that certain items are more important than others (high factor loadings), or represent more extreme levels of duress (threshold values) or are less interesting due to a large taste component or near universal ownership, though the results are less clear than we had hoped.

Overall, there is an indication that some factors are less important than others, for example, the collections of durable good ownership, in accounting for variation in *Wellbeing*. These questions may be pared down in the questionnaire, as a group, in favor of questions about housing and neighborhood conditions. While no selection of questions is made at this time, it is hoped that this study sheds light on choices that must be made about improvements to the questionnaire design of the adult wellbeing module in the SIPP.

Conclusion

This study has examined a large set of questions, collected together on an ad hoc basis, as they relate to a single construct. The central question became, what is this single construct? What emerged was an intuitive and straightforward model of material *Wellbeing*. Our model revealed five factors that relate to objective conditions in peoples lives – their household possessions, their housing, their neighborhoods, their community services, and their ability to make ends meet.

This study represents an initial attempt to bring to bear statistical analyses to a data collection and survey design question. One problem faced by this endeavor is the fact that a large series of questions contribute to the larger concept that we are trying to measure, *Wellbeing.* This concept is not measured by a single dimension but rather a collection of dimensions taken together. Using exploratory and confirmatory factor analysis led to a reasonable grouping of important factors as well as some indication of the relative importance of the factors. Higher order factor analysis pointed to a systematic method of including all factors in the measurement of *Wellbeing* and an initial indication of the relative importance of the five factors considered here.

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Table 1				
Exploratory Factor Analysis – Fit Statistics				
Number of factors fit	Degrees of freedom	Residual chi-squared	Root mean standardized error of estimate (RMSEA)	Weighted least squares minimum variance (WLSMV)
1	644	127,022.9	0.090	0.130
2	697	89,203.9	0.075	0.108
3	737	65,902.7	0.062	0.090
4	764	49,740.9	0.053	0.076
5	770	35,334.2	0.045	0.063
6	754	25,040.5	0.038	0.057

Table 2: Absolute Value of Factor Loadings, Exploratory Model, Oblique Rotation

Variable	Label	Factor Number				
		1	2	3	4	5
RADWASH	Lack washing machine	**0.95**	-	-	-	-
RADDRYR	Lack clothes dryer	**0.96**	-	-	-	-
EADDISH	Lack dishwasher	**0.59**	-	-	-	-
EADREFR	Lack refrigerator	**0.32**	-	-	-	-
EADFRZ	Lack freezer	**0.39**	-	-	-	-
EADTELV	Lack color television	**0.48**	-	-	-	-
EADSTOV	Lack stove	**0.42**	-	-	-	-
EADMICR	Lack microwave oven	**0.59**	-	-	-	-
EADVCR	Lack VCR	**0.63**	-	-	-	-
EADAIR	Lack air conditioner	**0.29**	-	0.24	-	-
EADCOMP	Lack computer	**0.61**	-	-	-	-
EADCELL	Lack cell phone	**0.59**	-	-	-	-
RADPHON	Lack telephone	**0.46**	0.21	-	-	-
EAHPEST	Problem with pests	-	0.24	**0.27**	-	-
EAHLEAK	Roof leaks	-	0.22	**0.35**	-	-
EAHWIND	Broken Windows	-	0.31	**0.46**	-	-
EAHWIRE	Exposed wires	-	0.23	**0.51**	-	-
EAHPLUM	Plumbing problems	-	0.26	**0.46**	-	-
EAHCRAC	Cracks in walls	-	0.27	**0.49**	-	-
EAHHOLE	Holes in floor	-	0.30	**0.46**	-	-
EAHREPR	Overall home repair	-	-	**0.80**	-	-
EAHSPAC	Space available in home	-	-	**0.79**	-	-
EAHFURN	Furnishings of home	-	-	**0.82**	-	-
EAHWARM	Warmth in winter	-	-	**0.84**	-	-
EAHCOOL	Coolnes in summer	-	-	**0.81**	-	-
EAHPRIV	Privacy of home	-	-	**0.78**	-	-
EACWALK	Nearby place afraid to walk at night	-	-	-	**0.88**	-
EACSTAY	Stay at home for safety	-	-	0.26	**0.92**	-
EACWITH	Go with others for safety	-	-	0.22	**0.90**	-
EACARRY	Carry something with for safety	-	-	-	**0.53**	-
EACNSAF	Safety of neighborhood	-	-	-	**0.85**	-
EACHSAF	Safety of home	-	-	-	**0.67**	-
RACWDOG*	Dog in home	0.35	-	-	-	-
EACALRM	Lack alarm system/timer for lights	**0.39**	-	-	-	-
RACMOVE	Crime so bad would move	-	-	-	**0.86**	-
EANTRAF	Noise problem in neighborhood	-	-	-	**0.45**	-
EANSTRT	Streets need repair	-	-	-	**0.28**	-
EANTRSH	Trash or litter	-	-	-	**0.57**	-
EANABAN	Abandoned buildings	-	-	-	**0.50**	-
EANIND	Problem industrial/commercial	-	-	-	**0.41**	-
EANODOR	Smoke or pollution	-	-	-	**0.37**	-
EANGHBR	Relations with neighbors	-	-	-	**0.44**	0.29
EANSAT	Overall satisfaction with neighborhood	-	-	0.21	**0.65**	0.28
RANMOVE	Neighborhood problems - would move	-	-	-	**0.81**	-
EAPHOSP	Satisfactory health services	-	-	-	-	**0.71**
EAPOLIC	Satisfactory police services	-	-	-	-	**0.84**
EAPFIRE	Satisfactory fire department	-	-	-	-	**0.86**
EAPTRAN*	Satisfactory public transportation	-	-	-	-	-
EAPSAT	Satisfactory overall public services	-	-	-	-	**0.73**
RAPMOVE	Public services - would move	-	-	-	**0.38**	0.37
EABMEET	Unable to meet essential expenses	-	**0.94**	-	-	-

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EABRENT	Did not pay rent or mortgage	-	**0.80**	-	-	-
EABGAS	Did not pay utility bills	-	**0.86**	-	-	-
EABPHON	Phone disconnected	-	**0.66**	-	-	-
EABDOCT	Needed to see doctor but didn't go	-	**0.74**	-	-	-
EABDENT	Needed to see dentist but didn't go	-	**0.72**	-	-	-
EAHLPFM	Help available from family	-	**0.46**	-	-	0.20
EAHLPFR	Help available from friends	-	**0.51**	-	-	0.26
EAHLPAG	Help available-agency or church	-	**0.41**	-	-	0.23
EAFOOD1	Enough and kind of food	0.20	**0.70**	-	-	-
EAFLAST	Worried food would not last	0.27	**0.82**	-	-	-
EAFBALN	Could not afford balanced meals	0.29	**0.81**	-	-	-

Loadings less than 0.20 excluded for clarity of presentation. Loadings in bold indicate groupings for final confirmatory analysis. Indicators with * marked were excluded from final model

Table 3: Factor Loadings and Thresholds from Confirmatory Factor Model		
Factor and indicator	Standardized factor loading	Threshold value
Consumer Durables		
Lack cell phone	0.66	0.39
Lack freezer	0.43	0.30
Lack computer	0.63	0.12
Lack dishwasher	0.80	-0.29
Lack alarm system/timer for lights	-0.44	-0.61
Lack air conditioner	0.46	-0.86
Lack VCR	0.62	-1.53
Lack microwave oven	0.65	-1.85
Lack telephone	0.72	-2.54
Lack stove	0.51	-2.74
Lack color television	0.59	-2.78
Lack refrigerator	0.49	-2.94
Lack washing machine	0.96	-3.71
Lack clothes dryer	0.99	-8.23
Resources Available to Meet Needs		
Needed to see dentist but didn't go	0.71	-1.95
Needed to see doctor but didn't go	0.74	-2.26
Phone disconnected	0.69	-2.33
Did not pay utility bills	0.85	-2.33
Unable to meet essential expenses	0.90	-2.35
Did not pay rent or mortgage	0.80	-2.59
Help available-agency or church	None	0.36	-0.53
	Some		0.28
	Most		1.04
Help available from family	None	0.42	-1.16
	Some		-0.63
	Most		0.21
Help available from friends	None	0.51	-1.47
	Some		-0.54
	Most		0.61
Enough and kind of food	Often not enough	-0.85	1.80
	Sometimes not enough		3.73
	Enough but not the kind		4.89
Worried food would not last	Often	0.90	-4.37
	Sometimes		-2.55
Could not afford balanced meals	Often	0.90	-4.76
	Sometimes		-2.89
Housing Conditions		
Problem with pests	0.57	-1.30
Roof leaks	0.50	-1.67
Broken Windows	0.65	-2.16
Cracks in walls	0.69	-2.32
Plumbing problems	0.65	-2.47

Exposed wires		0.69	-3.25
Holes in floor		0.71	-3.29
Space available in home	Very dissatisfied	0.73	-2.74
	Somewhat dissatisfied		-1.74
	Somewhat satisfied		-0.23
Privacy of home	Very dissatisfied	0.77	-3.24
	Somewhat dissatisfied		-2.34
	Somewhat satisfied		-0.67
Furnishings of home	Very dissatisfied	0.78	-3.54
	Somewhat dissatisfied		-2.37
	Somewhat satisfied		-0.28
Coolnes in summer	Very dissatisfied	0.79	-3.05
	Somewhat dissatisfied		-2.07
	Somewhat satisfied		-0.41
Warmth in winter	Very dissatisfied	0.82	-3.62
	Somewhat dissatisfied		-2.65
	Somewhat satisfied		-0.80
Overall home repair	Very dissatisfied	0.83	-3.64
	Somewhat dissatisfied		-2.47
	Somewhat satisfied		-0.32

Neighborhood Problems and Crime

Nearby place afraid to walk at night		0.64	-0.75
Noise problem in neighborhood		0.52	-0.92
Streets need repair		0.45	-1.05
Carry something with for safety		0.43	-1.61
Problem industrial/commercial		0.47	-1.66
Go with others for safety		0.72	-1.67
Abandoned buildings		0.60	-1.70
Stay at home for safety		0.75	-1.71
Smoke or pollution		0.51	-1.88
Trash or litter		0.72	-1.93
Public services - would move		0.71	-2.85
Neighborhood problems - would move		0.89	-3.28
Crime so bad would move		0.88	-3.49
Relations with neighbors	Very dissatisfied	0.69	-3.10
	Somewhat dissatisfied		-2.22
	Somewhat satisfied		-0.43
Safety of home	Very unsafe	0.79	-3.96
	Somewhat unsafe		-2.76
	Somewhat safe		-0.31
Safety of neighborhood	Very unsafe	0.85	-4.11
	Somewhat unsafe		-2.54
	Somewhat safe		0.01
Overall satisfaction with neighborhood	Very dissatisfied	0.89	-5.08
	Somewhat dissatisfied		-3.47
	Somewhat satisfied		-0.59

Community Services

Satisfactory health services	Very dissatisfied	0.72	-2.69

	Somewhat dissatisfied		-1.95
	Somewhat satisfied		-0.30
Satisfactory overall public services	Very dissatisfied	0.82	-3.77
	Somewhat dissatisfied		-2.78
	Somewhat satisfied		-0.29
Satisfactory police services	Very dissatisfied	0.89	-4.39
	Somewhat dissatisfied		-3.25
	Somewhat satisfied		-0.66
Satisfactory fire department	Very dissatisfied	0.84	-4.62
	Somewhat dissatisfied		-3.76
	Somewhat satisfied		-1.05

Table 4: Variance of Latent Variables Explained by Second Order Factor	
Latent Variable	R-Squared
F1: Consumer Durables	0.267
F2: Resources Available to Meet Needs	0.438
F3: Housing Conditions	0.637
F4: Neighborhood Problems and Crime	0.509
F5: Community Services	0.331

Appendix: Agreed question list for Family Resources Survey: UK
 McKay and Collard, 2003

Do you and you family have…/ Are you and your family able to afford…
SHOW CARD
  1. We have this
  2. We would like to have this, but cannot afford it at the moment
  3. We do not want/need this at the moment

Adult deprivation:
A holiday away from home for one week a year, not with relatives
Replace any worn out furniture
A small amount of money to spend each week on yourself, not on your family
Regular savings (L10 a month) for rainy days or retirement
Insurance of contents of dwelling
Have friends or family for a drink or meal at least once a month
A hobby or leisure activity
Replace or repair broken electrical goods such as refrigerator or washing machine
Keep you home adequately warm
Two pairs of all weather shoes for each adult
Enough money to keep you home in a decent state of repair

Child deprivation:
A holiday away from home at least one week a year with his or her family
Swimming at least once a month
A hobby or leisure activity
Friends round for tea or a snack once a fortnight
Enough bedrooms for every child over 10 of different sex to have his or her own bedroom
Leisure equipment (e.g. sports equipment or a bicycle)
Celebrations on special occasions such as birthdays. Christmas or other religious festivals
Play group/nursery/toddler group at least once a week for pre-school aged children
Going on a school trip at least once a term for school aged children

Debt:
Are you behind with repayments for any of these items?
Long list of bills, credit commitments and so on.