

CHAPTER 7 – CONCLUDING COMMENT

This report has described the development of a full-spectrum direct measure of living standards. For the purposes of the research, living standard has been conceived as a latent variable reflected in various forms of consumption, which means that it is mediated by access to the economic resources necessary to sustain consumption. For that reason, the measure has been referred to as a scale of economic living standards.

The measure comprises 40 items that relate to possessions (personal and household items), social participation activities (interaction with family and friends, holidays), degree of economising – including having no need for economising – across many areas (food, clothing, recreation, use of medical services), along with self-ratings (of the respondent's standard of living, satisfaction with standard of living, and adequacy of current income to meet basic everyday needs). Taken together, the items provide a comparatively rich, multi-faceted description of the respondent's situation. The information provided by the items is combined by means of a comparatively simple procedure to produce a single score that can range from 0 to 60. The new measurement tool that is defined by this procedure has been called the Economic Living Standard Index (ELSI).

Rationale for the New Measure

This concluding section of the report will recapitulate the description given earlier on how the scale was developed. However, before doing that, it is helpful to sketch broadly the context in which the work arose and how that context gave rise to a perceived need for a new tool of the type that has been developed.

Governments have had a long-standing interest in people's economic circumstances and the factors that influence their circumstances. Social scientists in several disciplines also have had a long-standing interest in those issues.

The study of people's economic circumstances is a large, amorphous field that has given rise to a large body of measurement research. Much of it has a highly specific focus, reflecting particular theoretical perspectives, issues and research methods that have developed in different specialties.

One major strand of sustained work concerns people's financial resources (their incomes, assets, etc.). At the macro-economic level, a great deal of research has been carried out on the distribution of income and factors that influence it, such as labour market structure, dynamics and economic growth. At the personal and household level, income is the variable that has been most commonly collected and studied.

There is another body of work that concerns what might be described as 'living standard outcomes'. In one way or another, those outcomes mostly relate to the individual's and household's consumption of good and services. That type of work has an equally long history.

There is yet a third general body of work that is concerned with outcomes in a broader sense. Examples are provided by the Nordic Living Conditions Surveys (Johansson, 2001) and the Swedish Living Standard Surveys (Jonsson, 1999). The latter arise from a framework that delineates nine components of welfare, which include housing and amenities, security for life and property, family and social relations, culture and recreation, and so on. As different components are studied separately, this approach results in a multi-dimensional account of living standards. The 'components of welfare' framework reflects a concern to link income and consumption with broader considerations of quality of life. A similar concern is reflected in such concepts as 'functionings' (Sen, 1982), 'inner quality of life' (Naess, 1999), and other work that relates to 'welfare in the wider sense' (cf. Allardt, 1993, who uses the concepts of 'having, loving and being'). The research described in this report is broadly located in the second tradition, which characterises living standard outcomes as being primarily a reflection of personal and household consumption.

There has been a large amount of theorising and research that is concerned with consumption in one way or another, but different specialities have scrutinised it through the use of different lenses. Poverty research has scrutinised consumption in relation to whether it fulfils basic needs (or, to cite one specific formulation of that idea, whether it avoids 'enforced lacks of socially defined necessities').

In contrast, marketers have tended to focus on patterns of consumption at the opposite end of the spectrum, being interested in the influence of lifestyle aspirations, the symbolic messages that are conveyed by consumption, and the sociological and psychological processes that are associated with 'conspicuous consumption'. (An early inspiration for such work came from the economist Thorstein Veblen, 1899, whose book *The Theory of the Leisure Class*, introduced the term 'conspicuous consumption'.) Some economists have been interested in developing formal theories of consumer behaviour that have used utility theory to provide a mathematical account of the way in which patterns of household expenditure vary systematically with differences in household composition and income (Deaton and Muellbauer, 1980).

The living standard outcomes that traditionally have received the most attention from both governments and social scientists have been poverty and deprivation. There is a large body of such research, extending over more than a century, that has described and measured the privations of poor people (hunger, discomfort, poor housing, inability to obtain medical treatment, and so on – cf. Rowntree, 1901; Booth, 1903; Townsend, 1979.) As described in Chapter 1, recent measurement research on poverty and deprivation has operationalised a consumption-based approach by combining information from multiple indicator items. The most commonly used type of consumption indicator is the 'enforced lack' (Mack and Lansley, 1985).

However, over recent years both governments and scholars have given attention to growing evidence that the harmful consequences of low living standards are only partly revealed by research grounded in a poverty framework. The newer evidence indicates that living standard differences above the poverty level may also produce substantial differences in health, life expectancy, children's educational achievement and crime. In addition, issues of inter-group social equity (such as those raised by differences between gender and ethnic groups in social and economic outcomes) are tending to be framed more broadly than in the past. As a consequence, there is interest in studying living standard outcomes from a broader perspective than that of poverty.

There is a well-documented association between current income and consumption (and hence between income and the living standard outcomes that are a reflection of consumption). However, it is also clear that the relationship is mediated by other factors (such as differences in assets, cost of housing, stock of household durables, assistance from support networks of family and friends, health status and disability, addictions, personal capabilities, and so on). A fruitful way of studying the relationship is within an input-output framework (which, in the present context, may better be described as an input-outcome framework). Living standard is the dependent variable whose variation might be explained by a variety of independent variables (amongst which income is prominent). The challenge is to produce models that significantly enhance understanding (at a quantitative level) of the processes that contribute to differences in living standards.

In this report, such a tool has been referred to as a 'direct measure' of living standards to signal its origin as an input-outcome analytical framework. The term is useful to distinguish the sort of measure that is needed from other living standard measures based on independent variables such as income. Such variables, because of their capacity to predict and explain living standards outcomes, can be used to generate useful measures of living standards. (Equivalised income is the pre-eminent example of such a measure.) However, such a living standard measure (which sometimes is referred to as an indirect or proxy measure) cannot be used as the dependent variable in an input-outcome analysis¹. To do so would involve circularity, with the phenomenon that is under scrutiny (living standard) being measured by means of a variable (income) that is used also to provide part of the explanation. A second requirement for the input-outcome analysis is that the dependent variable should be unidimensional. If it is a multidimensional composite of factors arising from different causal mechanisms, then it will not be possible to explain its variation by means of a single explanatory model; a good explanation will require the prior decomposition of the dependent variable, with its different component parts being explained through different models.

The impetus for the research was a perceived need for a unidimensional, broad-range direct measure of living standards, the development of which would draw upon previous deprivation measurement using consumption indicators and self-ratings. It was recognised that such a measure would have

¹ It was noted in Chapter 1 that some writers (e.g., Ringen, 1988) have used the terms 'direct' and 'indirect' measures in a somewhat different sense to the present use.

several attractive features over and above its capacity to perform the role discussed above, and this added to the desirability of proceeding with the work.

Some of these features were:

- the measure's descriptive aspect, resulting from the use of items that express common ideas about living standards, thus providing a multi-faceted descriptive picture, numerically summarised by the score
- the high face validity and sense of transparency that can be achieved by adopting such a descriptive approach
- the ease with the descriptive scale content can be used to provide a straightforward framework for the interpretation of scores
- the measure's potential for use in descriptive research directed at examining and comparing the living standard distributions of groups and examining inequality
- the measure's potential for use as an independent variable in research directed at explaining differences in health outcomes, children's school performance, and so on
- the measure's potential to enrich many areas of policy analysis, especially those of social equity and targeting, where it could augment the use of income and domain specific variables (such as disease rates), and thus provide a wider perspective.

Development of the Economic Living Standard Index (ELSI)

This project grew out of a previous study (initiated by an advisory group called the Super 2000 Taskforce) of the living standards of older New Zealanders (operationally defined as people aged 65 years and older not in institutions). That study involved three separate surveys: of the older population generally; of Māori aged 65-69 years; and of people aged 18-64 (included to provide some comparison data that would give a context for interpreting the results on older people). Following the disbanding of the Taskforce in March 2000, responsibility for the research was handed over to the Ministry of Social Policy (now the Ministry of Social Development) which carried it to completion. The results of these studies are published in Fergusson et al. (2001) and Cunningham et al. (2002).

As part of that work, a living standard measure, the Material Well-being Scale, was developed to measure the living standards of older people. 'Living standards' was conceptualised as a latent

variable reflected in the pattern of association between a number of observable indicators. Broadly, these indicators related to restrictions because of cost in consumption and in participation. They were in the form of items on specific types of possessions and activities foregone because of cost, financial problems arising from maintaining ordinary day to day consumption, and respondent self-ratings. Housing indicators were not included because previous work had suggested that they are not part of the latent variable reflected in the other indicators, although they are statistically associated with the latent variable. The indicators defined a measurement model that was tested by means of the statistical procedure of confirmatory factor analysis (CFA). An adequate fit of the data to the model was achieved, and the Material Well-being Scale was derivable from the data as a well-specified, robust, reliable, valid, unidimensional construct.

The present research makes use of the data collected in the older New Zealanders and working-age population surveys and combining them by means of respondent weights to provide a statistical representation of the total population. The research also adopts the conceptual model used to specify the older people's scale (which is examined for its applicability to the population) and makes use of the same analytic methods for the first stage of the scale development. It begins with the question: is it possible to produce a generic population living standards scale similar to the older persons' Material Well-being Scale? This report has described a series of analyses that show it is possible to construct such a measure.

The initial stage of testing the model of the Material Well-being Scale indicated that it was not entirely suitable for the population as a whole. However, removal of one of the indicator variables (relating to serious financial problems) gave a satisfactory fit to the population data. The modified model was found to be a reliable and robust measure of living standards, for both the whole population, and sub-groups within the population.

The second stage of the analysis was to use the latent variable specification of the generic scale to develop a general use form for the scale. This was guided by the need to develop a theoretically meaningful scale which could be readily used by researchers and policy makers alike. The conceptual framework of Item Response Theory was used to carry out an extensive re-examination of the items that estimate the latent variable. This analysis examined the extent to which the individual items, and the combined group, fulfilled a set of criteria specified to ensure the validity and discriminating power of a total score scale. This resulted in the removal of a number of items. The ones retained had high discrimination power and were invariant across various sub-groups within the sample. The relatively strict criteria that were applied identified a set of 39 items.

It was found that the total score scale would better maintain the distribution of the generic scale if it was augmented by the addition of a self-rating that was not in the generic scale. Testing of that item (of satisfaction with standard of living) indicated that its inclusion did not undermine the unidimensionality of the scale. This provided a set of 40 items that was used to define the general use

form. A simple procedure was devised to combine the items to produce a score that had the statistical properties of the generic scale score. The resulting measure is the Economic Living Standard Index. As with the latent variable model, this form of the scale contains items that measure ownership restrictions, social participation restrictions, economising behaviours and self-ratings.

An interpretative framework of calibration information was developed. This permits interpretation of the ELSI scale scores, giving them meaning by connecting them with common ideas about what characterises a high or low living standard. This was done by providing a statistical portrait of people at each level of the scale. These portraits are in terms of the extent to which people in that scale region lack designated basics and have designated comforts and luxuries. The calibration results show the expected systematic shift in lack of basics and attainment of comforts/luxuries from each part of the score range to the next. Illustrative vignettes are presented as another way of indicating the differences in standard of living across the ELSI score range.

Have the Scaling Challenges Been Met?

Chapter 1 of this report identified six challenges posed by the task of developing a broad spectrum living standard scale. How well have they been met?

The development of the scale from the initial set of candidate items was done in two stages. The first was the fitting of the CFA model and the specification of the CFA generic scale. The scores on this scale were obtained as regression estimates of the unobserved latent variable whose existence was demonstrated by the successful fitting of the model to the data. The second stage was analysis of the individual items to select the subset that defines the general use form of the form (i.e., ELSI). Both stages have made contributions to meeting these challenges.

Accounting for tastes and preferences: If the scale content were to be heavily loaded with preference-specific items, and preferences differed widely for the items, the data would lack sufficient structure for a model fit to be achieved and the latent variable to be revealed. The successful fitting of the model therefore demonstrated that the item set was not unduly affected by the effects of heterogeneity of preferences. Minimising the possible effects of preference differences was one of the considerations in specifying the criteria for the selection of ELSI items from the items in the generic scale. Given that the existence of the generic scale has been established, the problem remaining is that differences between people in their preferences have the potential to reduce the precision of the scale. The extent to which this occurs depends on whether the item set, as a whole, is more relevant to some people than to others. Item selection for ELSI ensured that such differences were minimised, but they certainly remain. It is difficult to quantify the extent to which they reduce precision. Such differences are most likely to arise from some of the ownership and participation items, such as owning a computer and taking overseas holidays. Fortunately, such items make up only a small proportion of the item set. It appears that the problems arising from preference differences have been contained but not completely eliminated.

Accounting for differences between groups: The CFA analysis indicated that essentially the same latent variable explained the associations between the indicator variables in each of the sub-groups examined. In the item analysis used for the selection of the ELSI items, great attention was given to ensuring the resulting item set was equally relevant to all sub-groups. A considerable number of items were eliminated because they were more widely preferred by some groups than by others, and thus created a risk of bias. All indications are that the risk was able to be substantially eliminated.

False consciousness: One of the considerations in the selection of ELSI items was whether preference for an item differed on the basis of the generic scale score. The requirement was that the trace curves relating to preferences should be flat across the score range of the latent variable. An item with such a trace curve is equally wanted across the score range. All items selected for ELSI met this condition. Accordingly, it can be stated that ELSI scores are not distorted by the effects of false consciousness.

Measuring higher living standards: The experience gained in the 1974 and 2000 scaling analyses on data for older people suggested that it is difficult to achieve discriminating power in the upper part of the continuum by means of items that are in the form of enforced lacks. In the present scale, discrimination in that part of the range has been sought through the three-point economising ratings and the four- and five-point self-ratings. This appears to have been a qualified success. The calibration results and the scale distribution indicate that it differentiates living standards across a continuum, but there are indications that some compression of scores occurs in the upper region of the range. Also, it is not entirely satisfactory that discrimination in the upper part relies more strongly on the self-ratings than in the lower part. It may be possible for these drawbacks to be reduced through future development work on the scale. This matter is revisited in the later section on limitations of the scale.

Aggregating items into the ELSI scale: It was possible to develop a procedure that met the conditions that were set. That is to say, it achieved simplicity while preserving the properties of the generic scale (its discriminating power and distribution).

Attributing meaning to the ELSI scores: An interpretive framework has been developed to characterise each level of the score range by means of five types of data, chosen to provide a readily comprehensible picture of a living standard. The picture is provided by indicating: the extent to which people at that level lack designated basics, the extent to which they have designated comforts and luxuries, the extent to which they have financial problems and accommodation problems and – for families with dependent children – the extent to which they lack child-specific basics. The limited amount of testing that has been undertaken suggests that this interpretive framework is generally effective in enabling meaning to be attributed to scale scores.

What Has Been Achieved?

Chapter 1 of this report ended with an analysis plan that showed an admission of defeat as one of the potential outcomes of the research. The plan was framed in that way to acknowledge that it simply might not be possible to construct a technically sound scale of the required type from the data that had been collected. Fortunately that has not been the outcome.

A scale of the intended form has been successfully derived from the data. The task had been specified as requiring the scale to have certain desirable properties. It has those properties. It also has some other attractive features that are worth noting.

Descriptive: The measure has a readily discernible connection with some common ideas about the nature of living standards, which gives it good face validity. The item set contains many of the things that are spontaneously cited as being relevant to describing a person's living standard. The relatively large size of the item set (40 items) and its breadth (which includes an element of self-assessment) give the scale a robustness that is difficult to achieve through the use of just a single type of information.

Simple: The items are combined in a fairly straightforward way, which enhances the sense of transparency. The items are easy to understand and to administer in sample surveys. The ease with which the scale data can be collected by survey researchers and used to calculate ELSI scores facilitates use of the scale. The scale possesses these features despite its having been produced through a complicated and sophisticated analysis intended to ensure its technical soundness.

Easy to interpret: The items, because of their content, provide a readily interpretable description of the respondent's situation. The scale score provides a summary of that description. This has been capitalised on to provide a simple but effective framework for the interpretation of the scale scores. The scale calibration is provided by means of a rich framework that covers deprivation of basics, attainment of comforts/luxuries, and occurrence of poverty-related financial problems and housing problems, with information on deprivation of child-specific basics provided in relation to families with dependent children.

Direct measure: The scale provides a 'direct measure' of living standards (in the sense described previously). In particular, it is not a measure defined by an income transformation that permits income to be expressed as a living standard proxy. This permits income to be examined as a source of living standards variation (which cannot be done when income is used as the measure of living standards), and permits research directed towards disentangling the respective roles of income and living standards in separately influencing outcomes in various social domains (health, education, justice, etc.).

Continuous: The scale gives a score that can be used as a continuous variable for parametric statistical analysis, avoiding the loss of power and analytic flexibility associated with categorical variables.

Parsimonious: The scale brings together various types of information which have been demonstrated by its methodology to be reflections of a common underlying construct, enabling these types of information to be validly combined. It is thus powerfully synoptic, with a large amount of information conveyed by its single score. This can sometimes be a disadvantage (as when it is desirable to make an explicit distinction between different components of the scale), but for many purposes it is an advantage, permitting a particular purpose to be achieved without unnecessary complexity being involved.

Versatile: The scale has the potential to be used in many different contexts and for many different purposes. It is well suited for general descriptive analysis (including comparisons between sub-groups); for research on the causes of living standard variation; for research examining the effect of living standard variation on outcomes in other areas (health, education, etc.); and for research on a wide range of social policy issues (ethnic inequality, targeting and evaluating social assistance, etc.). The relative ease with which the scale can be incorporated into sample surveys enhances its versatility. The scale has been constructed in a way that ensures its suitability for comparing results obtained in different years and monitoring living standards over time. The scale's potential uses are set out more fully in the last section of the chapter.

Valid and reliable: Finally, the scale is reliable and meets the validity criteria that have been able to be applied to date. In particular, it has face validity on the basis of the item content; it has concurrent validity on the basis of its statistical associations with equivalised income and a number of other relevant correlates of living standards; and has construct validity on the basis of the results it produces for groups known to have generally good or generally poor living standards. (The last point can be examined more fully by consulting *New Zealand Living Standards 2000*, which makes use of the ELSI scale to generate a wide range of descriptive results; they tend to enhance confidence in the scale's validity.) The validity of a measure such as ELSI is always provisional in the sense that there is no way to exclude the possibility that future applications will reveal the scale to have previously undisclosed defects.

Limitations, Reservations and Desirable Enhancements

There are some reservations about the scale that should be kept in mind when it is used and which deserve to be given attention in future development work. In addition, the scale has certain inherent limitations that should be kept in mind in deciding when to use it and how the results should be interpreted.

1. Inspection of the content of the scale items, and of the shape of the item trace curves (which indicate the point on the continuum where the each item offers maximum discrimination) suggest that the scale has some degree of compression at the top end, causing a greater degree of right-hand skew than would otherwise be the case. Score differences in the upper part of the range appear to have discriminating power (as judged from calibration data and similar results for incomes and assets, which show a positive gradient with scale score right to the top of the range), but score values are probably closer together than ideally they should be. The most promising way of extending the top part of the range is probably to include items that make distinctions of quality. As noted earlier, a pair of Nike sports shoes is not equivalent to a pair of bargain basement shoes. In contemporary societies, quality is an important signifier of living standard. The failure to incorporate this distinction into items does not mean that it is not to some extent captured by the scale scores. It is likely, for example, that people with high scale scores – who record overseas holidays and do not economise at all on shopping or the pursuit of hobbies etc. – have better shoes on average than people with low scores. In other words, some items that contribute to high scores are probably functioning partly as proxies for items measuring quality. None the less, the introduction of distinctions of quality is desirable. It could be expected to increase both the scale's discriminating power and validity.
2. As noted in the section on challenges, differences between people in their preferences have the potential to reduce the precision of the scale. The extent to which this occurs depends on whether the item set, as a whole, is more relevant to some people than to others. Item selection for ELSI sought to control for this. The risk arises mainly from ownership and participation items that can be afforded by only a minority of people. Fortunately such items make up only a small proportion of the item set. Some loss of precision probably occurs but it is probably small. It cannot readily be quantified.
3. The subjective element contained in the items creates the potential for response bias. People may differ in the standard of the living that they rate as 'high'; in the degree of economising they consider to be 'a lot'; and in the degree of interest they require to have in an item of property before they will describe themselves as wanting it. The potential for response bias exists with most types of survey data obtained as unverified (or unverifiable) interview responses. There is no indication that such bias is greater in the present data than in most interview data but the extent is unquantified.
4. The scale was developed in a particular social and economic context (New Zealand in the year 2000). To some degree its content is specific to that context. Over time the item set will 'age', and some items will change their properties and may cease to contribute. For example, computer ownership presently contributes to the scale's discriminating power in the upper part of the continuum. If computers become cheap and universally owned (like television sets), the

item will become useless. Any decline in the utility of the item set is likely to occur comparatively slowly. However, it will be desirable – as with the Consumer Price Index – for its content to be reviewed from time to time to ensure that the scale’s validity and discriminating power are preserved.

5. As noted earlier, the CFA model was specified without an indicator variable for housing problems because previous research had suggested that the inclusion of housing would cause the model to be rejected. This was despite there being a strong statistical association between the housing items and the scale score; that association provides the basis for the housing items to be used in the calibration of the scale and thus to contribute towards the interpretation of the scores. Subsequent checking on whether the inclusion of housing would have led to the model’s rejection confirmed that it would have. It would be desirable to try to clarify the relationship between housing quality and the living standard construct measured by ELSI. Housing quality has commonly been regarded as an aspect of living standard. If it truly does not fit within a unidimensional construct containing the components of ELSI, then it may be desirable to develop a separate scale for housing, which in some contexts would be used in parallel with the ELSI scale.
6. Finally, when planning research it will need to be kept in mind that an economic living standard, as measured by ELSI, represents only one aspect of well-being. When the purpose of the research requires that consideration to be given to other aspects, such as quality of life, life satisfaction, happiness, and so on, then it will be necessary to include separate measures of those things. Some purposes may best be served by using a suite of measures.

Potential Uses of the Scale

The possible uses of the scale have been touched upon in various places throughout this report. The present section brings together and elaborates on the previously identified uses, which are grouped under four large headings.

Descriptive Analysis

The types of analysis referred to as descriptive arise mainly from two types of questions. The first is of the form: ‘what are the living standards of people in the group under consideration?’ (which may be the population as a whole), and can be answered by indicating the proportions of the group whose living standards fall into different parts of the range. The second type of question concerns the comparative position of different groups. An illustration of the first type of use is provided by Fergusson et al. (2001), who used the Material Well-being Scale to describe the living standard distribution for older New Zealanders, with particular focus on the proportion with scores below a threshold designated as indicating hardship. Krishnan et al. (2002) make use of ELSI for the same purpose, providing results for older New Zealanders (which align closely with those given by the

MWS) and for many other groups (families with children, people with low income, social security recipients, and so on). In addition, Krishnan et al. provide many inter-group comparisons (using pictorial representations of distributions, means, and proportions below thresholds). To give a contrasting perspective, they also provide some results based on equivalised incomes.

This juxtaposition of the two types provides some striking illustrations of the way in which these measures can give strongly contrasting results. For example, most older New Zealanders have relatively modest equivalised incomes but good ELSI scores, while people whose main source of income is from social security benefits have predominantly low values on both measures. The similarities and contrasts between the results illustrate how the two types of information, considered together, provide a more richly differentiated picture of the population than either type of information by itself.

Research to Explain Living Standard Variation

Many social interventions are intended to alter the living standards distribution, usually by raising the living standards of people in the bottom part of the range. Policies intended to achieve that purpose are likely to be more effective when they are based on good understanding of the processes that cause people to differ in their living standards. ELSI provides a potentially powerful tool for systematic quantitative research on this issue. The study reported by Fergusson et al., 2001, provides an example for such research in relation to older New Zealanders. Its examination of factors influencing the living standards of that group served to highlight not only the positive role of modest housing costs (achieved mainly through debt-free home ownership) and financial assets, but also the negative role of adverse life events (such as divorce, periods of unemployment and business failure) over the 10 years prior to turning 65. As explained earlier, a major goal of the current research was to create a scale that would be suitable for use as the dependent variable in such analyses.

Effect of Living Standards on Other Types of Social Outcomes

It is now widely believed that living standard differences have pervasive social effects. This issue is most commonly investigated by using a proxy living standards measure (equivalised income). Income shows statistical associations with a wide range of social variables, but some social scientists have argued that correlational analysis has tended to over estimate its importance because of the difficulties in adequately controlling for the effects of variables correlated with it (Mayer, 2002). ELSI provides an additional tool for seeking to disentangle the effects of income from the effects of living standards. More generally, it provides a tool for separating the role of living standards from many other variables known to be associated with social outcomes (for example, health status, life expectancy, school attainment, offending, etc.), and to build up a picture of the relative importance of living standard differences in explaining a wide range of phenomena. In such analyses, ELSI can be used as one of several independent variables which are used to analyse variation in the phenomena being studied.

Specific Social Policy Applications

The scale has potential applications (some arising from the analytic uses described above) in many particular areas of social policy. These uses include:

- providing an additional perspective in the study of social assistance targeting – for example, using the scale to examine the extent to which the eligibility criteria and take-up of various forms of social assistance result in assistance being directed towards people with low living standards, and using the results of such analyses to achieve better targeting when that is a priority
- using the scale to assess the impact of policy interventions in improving the position of people with low living standards, as an aid to improving the effectiveness of interventions
- using the scale to examine issues of income equivalence (i.e., the relative amounts of income required for family households of different sizes and characteristics to achieve the same standard of living) and possibly to estimate equivalence ratios, which are used in assessing and adjusting assistance relativities
- using the scale to better understand and interpret statistics produced by income-based living standard proxy measures (such as equivalised income), which are used extensively in quantitative policy analysis
- enhancing public debate on how poverty should be defined and tackled, together with debates on related issues of inter-group inequities, social goals and social priorities
- providing another option for measuring and monitoring poverty (by designating an ELSI value as a poverty threshold)
- providing the government with an additional way to frame policy goals, set targets and monitor progress
- using the scale to augment analyses of social equity issues (such as affirmative action policies, extent and nature of gender gaps, intergenerational inequities).

Whether the scale finds a place in future social research and social policy analysis will depend, of course, on whether it is employed and found to be useful. In the first instance, that will depend on whether it is seen to have sufficient promise to justify its being tried out for some of the purposes indicated. In the long run, the scale's value will depend on whether it is able to demonstrate a capacity to make a worthwhile contribution to social understanding.

The scale that has been specified is capable of significant improvement: it should be regarded as a prototype rather than a final product. If it does prove useful, it should undergo further development. The form of the ELSI measure makes it particularly amenable to being refined in ways that increase its utility while preserving its basic character.

REFERENCES

- Allardt, E. (1993). Having, loving, being: An alternative to the Swedish model of welfare research. In M. Nussbaum & A. Sen (Eds.) *The Quality of Life* (pp. 88-94). Oxford: Oxford University Press.
- Becker (1965). A theory of the allocation of time. *Economic Journal*, 75, 493-517
- Bentler, P. M. (1989). *EQS structural equations program manual*. Los Angeles: BMDP Statistical Software.
- Bentler, P. M., & Bonnett, D. G., (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, 88, 588-606.
- Bollen, K. A. (1989). *Structural equations with latent variables*. New York: Wiley.
- Booth, C. (1903). *Life and labour of the people of London*. London: Macmillan.
- Bray, J. R. (2001). *Hardship in Australia: An analysis of financial stress indicators in the 1988-99 Australian Bureau of Statistics Household Expenditure Survey*. Occasional Paper Number 4. Department of Family and Community Services.
- Browne, M. W. (1982). Covariance structures. In D. M. Hawkins (Ed.), *Topics in applied multivariate analysis* (pp. 72-141). New York: Cambridge University Press.
- Browne, M. W. (1984) Asymptotically distribution-free methods for the analysis of covariance structures. *British Journal of Mathematical and Statistical Psychology*, 37, 62-83.
- Carver, C. S. (1989). How should multifaceted personality constructs be tested? Issues illustrated by self-monitoring, attributional style, and hardiness. *Journal of Personality and Social Psychology*, 56, 577-585.
- Cronbach, L. J. (1990). *Essentials in psychological testing* (5th ed.). New York: HarperCollins.
- Crothers, C. (1993). *Manakau quality of life survey*. Auckland: Manakau City Council.
- Cunningham, C., Durie, M., Fergusson, D., Fitzgerald, E., Hong, B., Horwood, J., Jensen, J., Rochford, M., & Stevenson, B. (2002). *Ngā āhuatanga noho o to hunga pakeke Māori: Living standards of older Māori*. Wellington: Ministry of Social Development.
- Davis, P., McLeod, K., Ransom, M., & Ongley, P. (1997). *The New Zealand Socioeconomic Index of Occupational Status (NZSEI)*, Research Report No. 2, Wellington: Statistics New Zealand.
- Deaton, A., & Muellbauer, J. (1980). *Economics and consumer behaviour*. New York: Cambridge University Press.
- Department of Social Welfare (1975). *Survey of persons aged 65 years and over: reporting of results relating to social security benefit rates*. Wellington: Department of Social Welfare.
- Easton, B. (1996). Income distribution. In B. Silverstone, A. Bollard, & R. Lattimore (Eds.) *A study of economic reform: The case of New Zealand*. Amsterdam: Elsevier.

- Fergusson, D. M., Hong, B., Horwood, J., Jensen, J., & Travers, P. (2001) *Living standards of older New Zealanders: A technical account*. Wellington: Ministry of Social Policy.
- Fergusson, D. M., Horwood, L. J., & Beautrais, A. L. (1981). The measurement of family material well-being. *Journal of Marriage and the Family*, 43, 715-725.
- Fergusson, D. M., Jensen, J. E., Fougère, D. S., Suckling, J. R., & Harding, S. J. (1974). *Survey of the material circumstances of the aged population: Policy working paper reporting results of analysis of preliminary data set of 1913 records*. Wellington, NZ: Department of Social Welfare.
- Glennester, H. (2002). Unites States poverty studies and poverty measurement: The past twenty-five years. *Social Services Review (March 2002)*. 83-107.
- Gordon, D, Adelman, L., Ashworth, K., Bradshaw, J., Levitas, R., Middleton, S., Pantazis, C., Patsios, D., Payne, S., Townsend, P., & Williams, J. (2000). *Poverty and social exclusion in Britain*. Joseph Rowntree Foundation: York.
- Gordon, D., Levitas, R., Pantazis, C., Payne, S., Townsend, P., Bradshaw, J., Middleton, S., Bramley., G., Bridgwood, A., Maher, J., & Rowlands, O. (1999). *Poverty and social exclusion in Britain: Questionnaire CASS/ESRC* URL: <http://qb.soc.surrey.ac.uk/surveys/pses/pses99.htm>.
- Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1995). *Multivariate data analysis with readings* (4th ed.). New York: MacMillan.
- Haleröd, B. (1994). *A new approach to the direct consensual measurement of poverty*. SPRC Discussion Paper No. 50. Social Policy Research Centre.
- Hatcher, L. (1994) *A step-by-step approach to using the SAS system for factor analysis and structural equation modeling*. Cary: SAS Institute Inc,
- Hull, J. G., Lehn, D. A., & Tedie, J. C. (1991). A general approach to testing multifaceted personality constructs. *Journal of Personality and Social Psychology*, 61, 932-945.
- Jensen, J. and Krishnan, V. (2001) Tracking living standards: Is it done better by EDY or HEDY? *Social Policy Journal of New Zealand/Te Puna Whahaaro*, 16, 127-155.
- Johansson, S. (2001). *Conceptualizing and measuring quality of life for national policy* (Korean Institute for Industrial Economics and Trade, FIEF Working Paper Series 2001, No. 171). Retrieved from <http://www.kiet.re.kr/files/econo/20020607-wp171.pdf>
- Jonsson, J. (1999). *The Swedish level of living surveys*. Retrieved 4/10/2002 from <http://www.ssd.gu.se/kid/swe/lnu.html>.
- Joreskog, K. G. & Sorbom, D. (1989). *LISREL VII user's reference guide*. Mooresville, IN: Scientific Software.
- Joreskog, K. G. & Sorbom, D. (1993a). *LISREL 8 user's reference guide*. Chicago: Scientific Software.
- Joreskog, K. G. & Sorbom, D. (1993b). *Structural equation modelling with SIMPLIS command language*. Chicago: Scientific Software.

- Kerlinger, F. N. & Lee, H. B. (2000). *Foundations of behavioral research* (4th ed.). Orlando: Harcourt.
- Kline, P. (1993). *The handbook of psychological testing*. London: Routledge.
- Kline, P. (1998). *The new psychometrics: Science, psychology and measurement*. London: Routledge.
- Krishnan, V. (1995). Modest but adequate: An appraisal of changing household income circumstances in New Zealand. *Social Policy Journal of New Zealand/Te Puna Whahaaro*, 4, 76-97.
- Krishnan, V., Jensen., J., & Ballantyne, S. (2002). *New Zealand living standards 2000: Ngā ahuatanga noho o Aotearoa*. Wellington: Ministry of Social Development.
- Layte, R., Maître, B., Nolan, B., & Whelan, C. T. (2001). Persistent and consistent poverty in the 1994 and 1995 waves of the European Community Household Panel Study. *Review of Income and Wealth*, 47, 427-449.
- Layte, R., Nolan, B., & Whelan, C. (2000) Poverty and affluence in Ireland: A comparison of income and deprivation approaches to the measurement of poverty. In D. Gordon and P. Townsend (Eds.) *Breadline Europe*. Southhampton: Policy Press
- Lord, F. M. (1980). *Applications of item response theory to practical testing problems*. Hillsdale, NJ: Erlbaum.
- Mack, J., & Lansley, S. (1985). *Poor Britain*, London: George Allen & Unwin.
- Mayer, S. E. (2002). *The influence of parental income on children's outcomes*. Wellington; Ministry of Social Development
- Mayer, S. E. & Jencks, C. (1989). Poverty and the distribution of material hardship. *The Journal of Human Resources*, XXIV, 88-113.
- Middleton, S. K., Ashworth., K., & Braithwaite, I. (1997). *Small fortunes: Spending on children, childhood poverty and parental sacrifice*. York: Joseph Rowntree Foundation.
- Mowbray, M. (2001). *Distributions and disparity: New Zealand household incomes*. Wellington: Ministry of Social Policy.
- Muthen, B. (1989) Latent variable modelling in heterogeneous populations. *Psychometrika*, 54, 557-585.
- Naess, S. (1999). Subjective approach to quality of life. *Feminist Economics*, 5
- Nolan, B. (2001). *Measuring and targeting poverty: The Irish example in indicators of progress: A discussion of approaches to monitor the governments' strategy to tackle poverty and social exclusion*. Centre for Analysis of Social Exclusion Report 13. London School of Economics.
- Nolan, B., & Whelan, C. (1996). *Resources, deprivation, and poverty*. Oxford: Clarendon Press
- Pedhazur, E. J. (1997) *Multiple regression in behavioral research: Explanation and prediction* (3rd Edition). Fort Worth, TX: Harcourt Brace

- Reise, S. P., Widaman, K. F., & Pugh, R. H. (1993). Confirmatory factor analysis and item response theory: Two approaches for exploring measurement invariance. *Psychological Bulletin*, 114 (3), 552-566.
- Ringen, S. (1988). Direct and indirect measures of poverty. *Journal of Social Policy*, 17, 351-365
- Rochford, M. (1987). *A survey of living standards of beneficiaries*. Research Series 8. Wellington: Department of Social Welfare.
- Rowntree, B. S. (1901). *Poverty: A study of town life*. London: Macmillan.
- Saunders, P., Hobbes, G., & Stott, H. (1988). *Income inequality in Australia and New Zealand: International comparisons and recent trends*. Social Policy Research Centre Discussion Paper.
- Sen, A. (1982). *Poverty and famines: An essay on entitlement and deprivation*. Oxford: Clarendon Press.
- Statistics New Zealand. (1998). *New Zealand now – incomes*. Wellington: Statistics New Zealand.
- Steiger, J. H. & Lind, J. (1980). *Statistically based tests for the number of common factors*. Paper presented at the meeting of the Psychometric Society, Iowa City, IA.
- Tabachnick, B. G. & Fidell, L. S. (1996). *Using multivariate statistics* (3rd ed.). New York: HarperCollins.
- Townsend, P. (1979). *Poverty in the United Kingdom: A survey of household resources and standards of living*. Harmondsworth: Penguin.
- Travers P., & Richardson, S. (1993). *Living decently*. Melbourne: Oxford University Press.
- United States Department of Commerce. (1995). *Current population reports, beyond poverty, extended measures of wellbeing 1992*, P70-50RV
- United States Department of Commerce. (1999). *Household economic studies, extended measures of well-being: meeting basic needs*, P70-67.
- Veblen, T. (1899). *The theory of the leisure class*. Dover: Dover Publications
- Waldegrave, C., & Frater, P. (1991). *The National Government Budgets of the first year in office: A report to Sunday Forum*. The Family Centre and Business and Economic Research Ltd.
- Waldegrave, C., Frater, P., & Stephens, B. (1997). An overview of research on poverty in New Zealand. *New Zealand Sociology*, 12, 213-259.
- Waldegrave, C., King, P., & Stuart, S. (1999). *The monetary constraints and consumer behaviour in New Zealand low income households*. The Family Centre Social Policy Research Unit, Lower Hutt.
- Whelan, C.T., Layte, R., Maître, B., & Nolan, B. (2001). Income deprivation and economic strain: An analysis of the European Community Household Panel. *European Sociological Review*, 17, 357-372.