APPLYING A CARDINAL MEASUREMENT MODEL TO NORMATIVE ASSESSMENTS OF INCOME: SYNOPSIS OF A PRELIMINARY LOOK

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People's feelings about income are not only a personal and societal issue but can also be subjected to rigorous scientific treatment. This is important from our point of view because, when cast in the proper framework, such feelings provide a useful perspective from which to analyze many aspects of the tax and transfer system [17].

A group of Dutch economists have developed the most comprehensive model for placing people's feelings about income in a scientific framework.[1] In this paper we will apply certain aspects of their model to attitudinal measures collected in the Income Survey Development Program (ISDP). Our discussion is divided into seven sections. In section one, we develop an informal description of the Dutch model and establish the theoretical relevance of single-item income satisfaction measures of the type employed in the ISDP. Sections two through six deal with our preliminary empirical investigation and discussion of the application of the Dutch cardinal measurement model to the ISDP measures. The study universe and our data are described in section two. The third section presents five alternative ways of transforming the ordinal seven-point delighted-terrible scale into a seven-point cardinal scale. In section four, the five cardinal scale variants are used to determine the normative content of income by income level. In a similar manner, the normative content of seven living levels is assessed and discussed in section five. In the sixth section, we look at the effects that perceived changes in financial situation have on the normative content of income. Section 7 concludes with a suggested agenda for methodological research. Sections 8 and 9 contain notes and references.

1.--The Dutch model

Van Praag and his associates have focused on measuring and explaining the normative metric or function which relates the entire range of a person's feelings about income, say from "very good" to "very bad", to specific income levels. They proceed in a very straightforward manner, presenting the respondent with a set of six to nine ranked normative labels and asking for the income amount that, given the individual's own circumstances, corresponds to each normative category. They refer to this set of categories as the "Income Evaluation Question" (IEQ). Based on the theoretical perspectives advanced by van Praag well before any empirical testing was carried out, it was hypothesized that the relationship between income and its normative content for a given individual would best be expressed by a log normal function [13].[2] Many thousands of individual measurements, taken throughout member countries of the European Community, appear to have largely sustained van Praag's theoretical perspective about the log normal [12, 16].[3]

The most important facets of an individual's normative field or space[4] pertaining to income are its center and upper and lower limits. In mathematical terms, the center is represented by the median of the income evaluation function (IEF) as expressed by a log normal distribution. The two most important factors in determining the income value of this median are first, the individual's current income and second, his family size [3,5,14].

From a given income position, the individual's normative field, as with geographical or topographical space, also has a horizon or limits. The distance that this horizon lies both ahead of and behind one's current income position varies from person to person and in mathematical terms is expressed as the log variance of the individual's income evaluation function, again in the log normal context.

The character of the horizons, or limits, of the individual's income field deserves some separate comment. Van Praag refers to these horizons or limits as "connected regions" -- the forward horizon as the "best most-connected region" and the rearward, or lower, horizon as the "worst most-connected region". A central implication of the existence of such limits is that there are income amounts, which can be expressed in terms of so many dollars more or less than one's current income, beyond which the individual cannot continue to make meaningful normative distinctions. For a given individual, at a given time, varying amounts of income within these "connected" regions have the same normative and psychological content. This is true despite the fact that the formal properties of income as an objective entity would permit abstract quantitative distinctions to be made between income levels falling beyond the normative horizon points.

Taking a step back from this concrete description of the individual's income field to its mathematical representation, these connected regions are identified as "0" and "1" on a cardinal scale. More precisely, the upper bound of the "worst most-connected region" is identified as "0" and the lower bound of the "best most-connected region" is identified as "1". It is between these limits that individuals are believed to have the ability to make cardinal or ratio distinctions between the normative implications of differing income levels. It is critical to note, however, that these judgements retain their "validity" only so long as the individual's current income position remains essentially unchanged.

Having specified separate income evaluation functions for a population of individuals, in conjunction with simultaneous measures of objective income, one is in the position to estimate the normative content of income from several different perspectives. First, mapping the individual's current objective income onto his own income evaluation function yields the normative content of the individual's current income. The [0,1] ratings associated with the other income points on the individual's IEF are taken to represent the individual's assessment of the normative content of income levels which depart from his current income.

It is important to note that these normative assessments are made from the perspective of the individual's current income position -- typically without the benefit of recent experience with those alternative levels -- and consequently are referred to as the *ex ante* "welfare content" of income for that individual.

By comparing the normative content of a given income level from this *ex ante* perspective with the normative content assigned to that income by individuals currently living at that level, the Dutch group have confirmed that average *ex ante* judgements by income level systematically differ from the average judgements of individuals currently experiencing those levels. These systematic differences are taken to arise from the accommodation process that begins once an individual reaches an alternative income level and begins to directly experience living at that level.[5]

This brings us to a third normative dimension of income, the *ex post* perspective, or that perspective attained by the individual after the accommodation process is complete. Using a cross sectional sample, this *ex post* perspective cannot be observed directly, but the Dutch have used the current normative content perspective to approximate the *ex post* situation. Clearly this has its drawbacks, since the average normative content of a given income level from the current perspective is based on a montage of perspectives -- persons recently arrived from higher or lower income levels, who have essentially an *ex ante* perspective, and those in various, but more advanced stages of the accommodation process. Thus, while not ideal, in the absence of other types of data, the "current" perspective permits what may perhaps be characterized as a first approximation of the *ex post* point of view.[6] [7]

The Dutch model and ISDP single-item income satisfaction measures.-- How do the insights provided by the Dutch model relate to the single-item income satisfaction measures collected in the Income Survey Development Program? Rather straightforwardly, in fact, if one assumes that when an individual is asked to make an assessment of how he feels about his income, he makes recourse to the same normative space that determines his income evaluation function. This seems like an eminently reasonable proposition, and it is our tentative position that the normative content of an individual's income, as measured by the direct single-item measure, and as implied by mapping his current income into his income evaluation function, are conceptually equivalent.[8]

By extension, then, the average normative content of current income for a given income level is equivalent, whether derived from the IEQ procedure or from direct single-item assessments. Furthermore, as in the case of the Dutch group, we can operationally identify these averages by income level with the ex post normative content of income. Consequently, in the balance of this paper we will explore some of the results of applying a cardinal measurement model, as inspired by the Dutch group's general approach, to the single-item ISDP measures. First a word about our study universe and the data.

2.--Source of the data and the study universe

The data for this paper are drawn from a nationally representative pilot study conducted in 1978-79 as part of a joint effort of the Department of Health and Human Services (HHS) and the Bureau of the Census to develop the Survey of Income and Program Participation (SIPP). Although the sample consisted of a self-representing area segment and a smaller list of Supplemental Security Income (SSI) recipients, this study is restricted to area frame cases only[9].

The nominal universe for the study consists of all households as represented by the head, or if married, the head's spouse. Although demographic and objective financial information was collected for all household members, only persons age 16 and older who were present at the time of interview, and who agreed to act as self-respondents, answered questions on how they felt about their financial situation. However, nearly all households (97 percent) are represented, either by responses of the head, the head's wife, or both. On the other hand, about 24 percent of households are represented twice, that is by responses of both the head and the head's wife. Initially this problem caused us considerable concern. However, after investigating its potential impact more closely, we no longer believe it has any material impact on the results presented here.[10]

Definition of key variables.-- The variables central to this paper are household income in March of 1978 and the respondents' normative assessment of family income. The income variable is taken from a single question about the income for the sample household in the month prior to interview (March 1978) and is known to suffer from a number of defects. The attitudinal assessments were obtained using a seven category delighted-terrible (DT) scale first developed by Andrews and Withey [2]. A more detailed description of both the subjective and objective variables is provided in [17]. Exact question wordings are available upon request from the authors.

3.--Converting the DT ordinal category values to cardinal scale points

The formal approach.-- As we noted earlier, the Dutch model posits that individuals evaluate their income over a zero/one normative interval. They also argue on theoretical grounds that the normative categories on their IEQ scale are separated by equal normative distances, and that the upper and lower end-points of the IEQ scale are to be associated with one and zero in this normative space [3, 14].

If some other scale is employed, and these same assumptions about its mapping to normative space are adopted, then constructing numeric scores for the scale intervals is a trivial exercise. The result for the seven category DT scale is given in table 3.1, column 2. We refer to this variant of the scale as the "equal interval" transformation.[12]

What if one accepts the Dutch group's characterization of the underlying psychological dimension as cardinal in nature but is uncertain about the manner in which a particular scale maps onto the [0,1] normative space? Suppose, for example, that the scale is believed to cover the full [0,1] interval, but that its categories are thought to delimit unequal segments of normative space? Or, alternatively, perhaps the scale might encompass less than the full [0,1] continuum and be characterized by unequal intervals as well.

How reasonable is the notion of identifying the categories "terrible" and "delighted" with the end-points of a normative continuum? Certainly the terms seem to connote evaluative states located well towards the margins of normative space. More importantly, Andrews and Withey provide a good deal of empirical evidence that this is the case, particularly in regard to the upper end of the scale [2:223-228]. However, they also have shown that two other scales, the so-called "ladder" and "circles" scales, appear to encompass a somewhat greater affective range [2:200-210]. Unfortunately, from available data it is impossible to tell whether this is because these scales employ a greater number of categories, or because the end-points are explicitly defined as representing essentially the best and worst possible situations for a given individual [2:210].[11]

Whatever the reason, since Andrews and Withey obtained measurements on multiple traits with the DT scale and with these other scales for the same

Table 3.1--Cardinal scores for delighted - terrible categories under differing cardinality assumptions

Category	Standard scale scores	Cardinality assumptions: Zero / one end-points: Adjusted scales: Equal interval	Adjusted scales: Ladder	Adjusted scales: Circles	Adjusted end-points and intervals: Ladder	Adjusted end-points and intervals: Circles
	(col. 1)	(col. 2)	(col. 3)	(col. 4)	(col. 5)	(col. 6)
Delighted.....	1	1.000	1.000	1.000	0.813	0.838
Pleased.....	2	0.833	0.918	0.912	0.750	0.775
Mostly satisfied.....	3	0.667	0.770	0.772	0.638	0.675
Mixed.....	4	0.500	0.590	0.579	0.500	0.538
Mostly dissatisfied...	5	0.333	0.410	0.351	0.363	0.375
Unhappy.....	6	0.167	0.180	0.193	0.188	0.263
Terrible.....	7	0.000	0.000	0.000	0.050	0.125
Mean scale value....	4	0.500	0.553	0.544	0.472	0.513

individuals in the same interview session, it is possible to "translate" the DT categories into these other scales. In fact, they carried out and reported on this operation as part of their assessment of the statistical properties of the DT scale [2:223-227]. Since the alternative scales employed geometrically equal intervals as well as end-points defined as "best" and "worst", the statistical translation of the DT responses into the responses on the other scales also sheds some light on the question of interval width.

Incorporating DT translations into cardinal specifications of the DT scale.-- We used the information provided by Andrews and Withey to construct four alternatives to the straightforward [0,1] equal interval cardinality specification. The first alternative assumes that the DT scale spans the full [0,1] evaluative interval, but forces the interval widths between categories to conform to those implied by the translation of the DT scale into the "ladder" and "circle" scales.

Thus the mean ladder score over five different traits for the delighted category was 7.5; for pleased, 7.0; for mostly satisfied, 6.1 and so forth. We subtracted adjacent category means to estimate raw interval width and projected the sum of the widths onto the full [0,1] continuum in such a way that the relative raw interval widths were preserved. The results of this translation are given in columns 3 and 4 of table 3.1.

However, since there is reason to question whether the 7 point DT scale extends completely to the [0,1] endpoints, especially on the positive end of the scale (i.e. '7'), scale transformations of this sort are not altogether satisfactory. In order to take this possibility into account, we developed an alternative approach which entails no a priori judgement about the cardinal end-point values of the DT scale, but forces them to be determined totally by the mapping of the DT scale onto the ladder or circles scale, as the case may be. These scale variants appear in columns 5 and 6, table 3.1.

4.--Average delighted-terrible (DT) scores by household income level

Table 4.1 contains the average delighted-terrible scores by monthly household income level for the equal interval specification and for the four alternative transformations for all responding household heads and their wives. We see that, without exception, the average attitudinal scores increase monotonically with income. However, differences between the highest two categories are very slight.[13]

The scores for the lowest category average about 75 percent of the scores for the interval in which the median falls ($900 - $1,199), and about 65 percent of the scores for the highest interval. The scores for the income group which contains the median run about 87 percent of the scores for the highest income group. Note that these percentages are quite stable across scale variations.

The equal interval variant, which assumes equal intervals and [0,1] end-points, is most similar to the two scale variants with adjusted end-points and intervals. Average scores by income level, associated with the equal interval specification, tend to fall midway between the two variants with adjusted intervals and end-points. On the other hand, the two variants with adjusted intervals, but [0,1] end-points, yield normative assessments by income level which are notably higher than the equal interval transformation.

The average scores, weighted by the raw number of respondents in each income level, range from a low of 0.551 for the equal interval scale, to 0.631 using the ladder adjustment over a full [0,1] interval. The grand average for all five scale variants is 0.580. On a percentage basis the average equal interval scale score varies between about 87 and 104 percent of the adjusted scale scores.

Separate tabulations for heads and wives with dependent children are presented in [18]. The relative stability of the normative content of income across cardinality specifications is also evident for this group. However, dispersion across income levels is greater and, at each income level, the normative content of income for parents is lower than for the sample as a whole. We suspect this is due to heavier "claims" on the income of parents as opposed to other household heads who do not have dependent children in their care.

Before turning from this discussion of table 4.1, it should be noted that we had expected substantially greater dispersion in the average normative assessments across income levels. We are not in a position at this time to indicate just why the dispersion is not greater. Life cycle and unit size effects might be expected to have a particularly strong impact among householders other than parents in the lower part of the income distribution. However, we also expect that measurement error in the objective income variable may be obscuring the actual extent of dispersion. This would be possible if, for example, the true income of persons nominally categorized in the lowest and highest income levels tended to lie closer to the center of the distribution. Under such conditions, correct classification of persons by income would reveal a lower average normative assessment in the "true" under-$300-a-month group and a higher average score for those actually in the $4,000-and-over category.

Table 4.1--Normative assessments of income by income level under differing cardinality assumptions

Household income for March, 1978	Ratio of interval limits to the sample median(1)	Cardinality assumptions: Zero / one end-points: Equal interval	Zero / one end-points: Adjusted scales: Ladder	Zero / one end-points: Adjusted scales: Circles	Adjusted end-points and intervals: Ladder	Adjusted end-points and intervals: Circles
Under $300.....	less than 0.32	0.426	0.491	0.478	0.425	0.466
$300 - $599.....	0.32 - 0.63	0.472	0.545	0.531	0.466	0.504
$600 - $899.....	0.64 - 0.95	0.505	0.583	0.571	0.495	0.532
$900 - $1,199.....	0.96 - 1.27	0.579	0.663	0.652	0.556	0.590
$1,200 - $1,599....	1.28 - 1.70	0.589	0.677	0.667	0.566	0.601
$1,600 - $1,999....	1.71 - 2.13	0.616	0.702	0.694	0.586	0.620
$2,000 - $3,999....	2.14 - 4.29	0.675	0.764	0.759	0.633	0.666
$4,000 or more.....	4.30 or more	0.676	0.766	0.759	0.635	0.666
Weighted average.....		0.551	0.631	0.621	0.532	0.567

(1) The sample median, as estimated by straight-line interpolation, is $935.

Source: April interview 1978 ISDP Panel, unweighted area frame counts.

5.--Average delighted-terrible scores by living level

There is a considerable tradition in the literature [8, 9] concerning normative living levels. The April interview of the 1978 ISDP panel contained an item which asked respondents to rate their family's financial situation in terms of seven distinct levels ranging from "prosperous" down to "can't even buy enough to eat". Three of the levels (prosperous, comfortable, and just enough to get-along) were adapted from Rainwater [9]. Since respondents who answered the living-level question also answered the prior delighted-terrible item on family income, we can, by crossing the two sets of responses, define each living level category in terms of its average delighted-terrible score. If the delighted-terrible responses are recast to conform to a cardinal measurement model, the differences between average DT scores can be interpreted as the normative distance between the various living levels. The results of this procedure are given in table 5.1.

There are a number of points about the data in table 5.1 that deserve comment. First, we note that the average DT score generally increases monotonically with living level.[14] While not startling, this finding is none the less reassuring.

Second, there appears to be considerably more dispersion in normative content across the living level categories than was the case with income. Comparison of tables 4.1 and 5.1 reveals that the normative content of the highest living level averages 3.2 times the lowest level while the average normative content of the highest income level averages only 1.5 times that of the lowest income level. Undoubtedly, the greater normative extremes evident in the living level scale are partly a function of the smaller and therefore more select groups identified in the polar categories on the living-level scale. However, in part, we also suspect that the greater dispersion reflects the absence of confounding errors which we believe exist in the objective income variable.

Third, data presented in [18] indicate that the normative content associated with the different living levels seems to be essentially the same for parents of dependent children and household heads in general.[15] This is in marked contrast to the situation with regard to income. If this relative invariability is taken at face value, it could be interpreted as indicating that these living levels have a common normative meaning that is fairly well defined throughout our society.

6.--Changes in financial position and the current normative content of income and living level

As we suggested in our introductory discussion of the Dutch model, if differences between ex ante assessments of alternative income levels and the current evaluations of persons living at those levels are to be taken as evidence of an accommodation process (i.e. "preference drift" in the Dutch framework) our view of this process may be somewhat distorted by the fact that at any given time individuals are in varying stages of accommodation to their situation, ranging over essentially the whole range from an ex ante to a completely adjusted or ex post position. Given these considerations, we thought it might be interesting to see how the normative content of income varies according to the way people compare their current financial position with that of five years ago.[16] The data are presented in table 6.1. For the sake of simplicity, only the equal interval [0,1] variant is shown.

The most interesting group is the one rating its current financial situation as being the same as five years ago. Since the empirical work that has been done on the preference drift question [4:96] suggests that the accommodation process is substantially completed within five years, the normative evaluations of this group might be taken to approximate the ex post position.

One question immediately comes to mind. To what extent do the average normative assessments of this subset, for a given income level, differ markedly from those of the over-all sample? This question is important because the answer may suggest whether substituting a "current" perspective for a true ex post perspective might involve serious distortions of the ex post normative content of income.

Assessing the significance of the differences between the "same" group and the total is complicated by lack of information on standard errors. However, examination of the normative content of income for the "same" group, expressed as a percentage of the normative content for all three groups, suggests relatively close agreement(< ± 10 percent), except in the lowest two income classes or where very small numbers are involved. One straightforward interpretation of this pattern would be that reliance on a "current" perspective as a substitute for the ex post point of view might tend to somewhat overestimate the extent of dispersion in the normative content of income across income levels. Although couched in different terms, this possibility has been suggested by Abramovitz [1:10].

Before turning from this section, we would like to emphasize that we consider the interpretations presented here to be frankly speculative.[17] Our primary intent has been to suggest the potential of this sort of approach for the examination of the differences between the current and ex post persective.

7.--Conclusion

In this paper we have attempted to apply the model of the Dutch economists van Praag, Kapteyn, et al to single-item income satisfaction measures of the type developed by Andrews and Withey. We then extended the Dutch approach by using the single-item measures to assess the normative content of a

Table 5.1--Normative assessments of living levels under differing cardinality assumptions

Normative living level	Cardinality assumptions				
	Zero / one end-points			Adjusted end-points and intervals	
	Equal interval	Adjusted intervals Ladder	Adjusted intervals Circles	Ladder	Circles
Prosperous	0.802	0.880	0.876	0.721	0.749
Comfortable	0.717	0.806	0.802	0.665	0.697
Somewhat more than getting along	0.641	0.735	0.731	0.611	0.646
Just enough to get along	0.496	0.577	0.562	0.490	0.526
Somewhat less than getting along	0.339	0.401	0.379	0.356	0.395
No way to make ends meet	0.192	0.223	0.216	0.220	0.279
Can't even buy enough to eat	0.218	0.258	0.239	0.247	0.295
Weighted average, all levels	0.551	0.631	0.621	0.532	0.568

Source: April interview, 1978 ISDP Panel, unweighted area frame counts.

set of seven living levels of the sort discussed by Rainwater. We feel our effort has been useful and instructive, if not conclusive. Obviously much more work needs to be done.

In the methodological area a number of steps come to mind.

1. Improved measures of objective income should be introduced and the income concept should be broadened to include a net of tax as well as the usual gross of tax concept.

2. Analyses should be carried out in the context of substantially larger samples.

3. Formal tests of the theoretical relationship between the Dutch income evaluation function approach and the single-item income satisfaction measures of the type discussed in the body of the paper should be conducted.

4. More thought should be given to the appropriate uses and limitations of single-item measures as compared to the set of parameters associated with the full income evaluation function.

5. Methodological work assessing the cardinality of the DI scale measures and alternative scales of the type that could be used in conjunction with the Dutch income evaluation question needs to be carried out. An approach similar to the one presented in sections 3 and 4 of this paper holds promise, but attention must be given to the regression towards the mean phenomenon, particularly in interpretation of the results.

6. More research needs to be undertaken in the measurement of normative living levels in the household survey context. This might take the approach suggested by Dubnoff and Rainwater (personal communication), that is, to have respondents assign dollar amounts to a living-level scale, perhaps using categories similar to those included in the single-item living-level question included in the 1978 ISDP panel.

7. More attention needs to be given to the difference between the current and ex post normative perspective. Since the extensive panel data that would be optimal for addressing this issue is not likely to become available in the near future, thought must be given to imaginative, low-cost alternatives.

8. Measures of deeper or more fundamental psychological states, such as depression and anxiety, should be collected together with income satisfaction measures in order to provide a more concrete context for evaluating their meaning and to contribute to a fuller understanding of the implications of using income satisfaction measures to make interpersonal comparisons.

While methodological work of this kind is of utmost importance and will undoubtedly yield theoretical dividends as well as improved measurement methods, there is also a need for researchers interested in subjective measures of this kind to illustrate their application to practical policy research issues. From the standpoint of maintaining the scientific integrity of these techniques, moving too quickly into the policy arena entails substantial dangers, but until the practical potential of subjective measures is more widely recognized and accepted, it will be difficult to attract the level of support necessary to perfect them.

8.--NOTES

1. The theoretical perspective which formed the original basis for the model was established more than a decade ago by van Praag [13]. During the 1970's, a number of Dutch social scientists, such as Goedhart, Kapteyn and van Herwaarden, working in conjunction with van Praag, made numerous contributions to the model via empirical testing and theoretical extensions of van Praag's initial work. Kapteyn, a key member of this group, is currently living and working in the United States.
2. The Dutch group label this function the "welfare function of income" (WFI) based on theoretical considerations advanced by van Praag in [13] and developed in [14] and elsewhere. However, beyond the sort of findings presented in [2 and 17] little empirical work has been done on relating the normative content of income to individuals' subjective assessments of their general well-being. As noted by Abramovitz [1:4], access to higher incomes need not be related in any simple, consistent, or straightforward manner to increases in total welfare. Although a direct relationship between the two variables is widely assumed, in the final analysis it remains an empirical question just how economic welfare, defined narrowly in terms of income, and overall individual welfare are related. Our work and that of Andrews and Withey, which uncovered no interactions between normative assessments of income and overall well-being, suggest that the empirical basis for van Praag's assertion could be developed from currently available data; however, until this has been done, we prefer to employ more conservative and perhaps less controversial terminology. Thus, throughout this paper we will generally substitute the phrases "income evaluation function" (IEF) and "normative content of income" for the Dutch group's usage.
3. Van Heerwaarden and Kapteyn [12] fit the IEQ responses of more than 14,000 respondents to twelve two-parameter functions. Using the residual variance criterion, they found that the log normal out-performed eleven alternatives. However, the logarithm function a + b[ln(y)], which does not have a strong theoretical justification, yielded a slightly better, statistically significant, fit. Additional research is under way in Europe to look into a number of questions which relate to

Table 6.1--Normative assessments of income by income level and present financial situation as compared to five years ago

Household income for March, 1978	Ratio of interval limits to the sample median(1)	Total	Present financial situation compared to five years ago		
			Better	Same	Worse
Under $300.....	less than 0.32	0.426	0.429	0.539	0.290
$300 - $599.....	0.32 - 0.63	0.472	0.495	0.547	0.369
$600 - $899.....	0.64 - 0.95	0.505	0.552	0.550	0.378
$900 - $1,199.....	0.96 - 1.27	0.579	0.646	0.583	0.452
$1,200 - $1,599....	1.28 - 1.70	0.589	0.620	0.621	0.487
$1,600 - $1,999....	1.71 - 2.13	0.616	0.673	0.608	0.451
$2,000 - $3,999....	2.14 - 4.29	0.675	0.691	0.690	0.586
$4,000 or more.....	4.30 or more	0.676	0.706	0.622	0.633
Weighted average.....		0.551	0.610	0.582	0.412

(1) The sample median, as estimated by straight-line interpolation, is $935.

Source: April interview 1978 ISDP Panel, unweighted area frame counts.

the appropriateness of the log normal specification for the IEF. In the meantime, the strong theoretical basis of the log normal, and the fruitful analytical results stemming from its use with the IEQ, argue for its continued application.

4. The use of the image of a "field" or "space" is somewhat misleading as the "space" does not appear to extend in all directions from the individual's current location . . . just ahead and above (higher incomes) and behind and below (lower incomes), but not to the right or left.
5. Scitovsky [10] and Abramovitz [1] have provided some very useful and interesting discussion of the social and psychological processes that may underlie this process. See also the general treatment by McNally [7].
6. A number of alternative kinds of data would permit modeling of various aspects of the accommodation process, including individual income histories tied to one-time cross-sectional normative assessments of income, time series data incorporating simultaneous observations of income and the normative assessments of income for individuals, as well as panel data linking income, personal circumstances, and normative assessments of income over a five to ten year period. While the latter would be the data base of choice, whether the ex post perspective could be observed directly, even in a panel context, is not obvious. Clearly, however, a panel would permit superior modeling of various segments of the accommodation process.
7. Even people living at a particular normative living level, such as the "get-along point", render their judgement from different positions within the accommodation process, ranging from the extreme of those recently arrived and still carrying their ex ante viewpoint, to those who are fully accommodated and therefore embody the "completed" ex post point of view. Unless the distribution of those arriving at the get-along point from higher and lower postions in normative income space is symmetrical, and unless the accommodation process is equivalent regardless of the direction of movement, in the absence of essentially arbitrary and fortuitous compensating errors, the current perspective must yield biased estimates of the ex post perspective. Whether or not the degree of bias would be substantial is, of course, an empirical question. Some evidence on this point is given in section six.
8. This notion could be tested empirically by collecting IEF's and direct normative assessments of current income in the same interview for the same individuals. If the assumption is correct, an estimate of the current normative content of the individual's income derived by mapping his actual income onto his IEF would, in the absence of random measurement error, be equal to the normative content of income as derived from the direct single-item measure. Of course the normative categories used in the income evaluation question and the direct, single-item measure should be the same. Also, income concepts used to define current objective income and the IEQ income responses would have to be equivalent or at least clearly defined so that the income concepts could be related unambiguously if they differed. Since random measurement error is known to be significant [2], even under ideal conditions the fit between the two measures on the level of individuals would be notably less than perfect. However, from data provided by Andrews and Withey, the maximum degree of fit between the two measures could be estimated in advance. On the other hand, by shifting to the population level, the problems posed by random measurement error could be side-stepped by comparing the expected (mean) normative content of income as defined by the two contrasting methods, by income level. The ISDP staff had planned a test of this type for the final wave of the 1979 survey panel. Unfortunately, Office of Management and Budget clearance for the income evaluation question was not obtained, and, as a result, the data required for the test were not collected as part of the Development Program.
9. For more details on the background and substance of the 1978 panel see [6,17,19].
10. We planned to redo our entire analysis after making compensating adjustments by simply halving the weights of husbands and wives if they belonged to a household in which each responded to the attitudinal items. We reasoned that this would insure that responses from such households contributed appropriately to overall estimates for the household universe. After carrying out this procedure, we discovered that bivariate distributions of income and income satisfaction and income satisfaction and living level were virtually identical to those obtained with the raw counts analyzed here.
11. Research carried out in the 1979 SIPP development panel using a 10 point DT scale has demonstrated that increasing the number of DT categories results in substantial reductions in the proportions of respondents falling in the two most positive categories. Using a split ballot technique, the proportion of the sample selecting the top two categories on the ten point version was roughly half that for the usual seven point version over a series of three different items. As time permits the authors intend to report on these results in detail.
12. Details of how we constructed all five variants are given in [18].
13. The reader will note throughout the paper that discussion of differences is unencumbered by reference to the possible effects of sampling variance. This informality is unfortunate, but standard errors based on the 1978 ISDP panel's stratified cluster sample design are not yet available.
14. The only exception occurs where the average DT score for what is putatively the lowest living level (can't even buy enough to eat) is higher than the next higher level (no way to make ends meet). However, since the number of sample cases is so small (N=13) this is not especially bothersome. More importantly, there seems to be little substantive difference in the normative content of these two levels.
15. Section 5 in [18] also contains a comparison of ISDP findings regarding the normative content of living levels with those of Rainwater, the Dutch group and Andrews and Withey.
16. Clearly the notion of financial position encompasses much more than just income. Other financial components such as assets and debts are included as well. So too are claims on financial resources such as the number of children and so forth. To the extent that changes in dependency status affect comparisons of present and past financial situation, the effects of "reference drift" as well as "preference drift" are also being captured by this item. See for example [5].
17. See [18] for additional discussion, especially concerning differences between the "better" and "worse" groups.

9.--References

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