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Social Science Research 37 (2008) 559–580
Social Science RESEARCH
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Multidimensional poverty: An alternative measurement approach for the United States? ☆

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Available online 25 July 2007

Abstract

International poverty research has increasingly underscored the need to use multidimensional approaches to measure poverty. Largely embraced in Europe and elsewhere, this has not had much impact on the way poverty is measured in the United States. In this paper, I use a comprehensive multidimensional framework including economic well-being, capability, and social inclusion to examine poverty in the US. Data from the 2004 General Social Survey support the interconnectedness among these poverty dimensions, indicating that the multidimensional framework utilizing a comprehensive set of information provides a compelling value added to poverty measurement. The suggested demographic characteristics of the various categories of the poor are somewhat similar between this approach and other traditional approaches. But the more comprehensive and accurate measurement outcomes from this approach help policymakers target resources at the specific groups.
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Keywords: Multidimensional poverty; Economic well-being; Capability; Social inclusion; General social survey; Structural equation

1. Introduction

Poverty research has widened its breadth and depth in the past few decades embracing more comprehensive conceptualizations. Thanks to Sen (1992, 1999) and others whose arguments have essentially reshaped the way we think about poverty. Going well beyond the notion of economic well-being embedded in the traditional approaches, these broader conceptualizations are increasingly multidimensional defined in human well-being terms. The concern for the multidimensional approach today is not 'whether' to operationalize, as some attempting to provide political or philosophical rationale argue (Lister, 2004; Pelletiere, 2006; Ravallion,

☆ This paper uses the 2004 General Social Survey data and I am thankful to the National Opinion Research Center for the data. Earlier version of the paper was presented at the 2007 Eastern Economics Association conference in New York. I am also thankful for the comments received from an anonymous reviewer. All errors and omissions are of course solely mine.
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doi:10.1016/j.ssresearch.2007.06.013

1996; Sen, 2000; Sengupta, 2005; Wagle, 2002), but rather 'how.' While many have attempted to operationalize poverty or some versions of the concept using multidimensional frameworks,[1] they have remained either narrowly conceived or highly disaggregated, thus missing important dimensions manifesting poverty. The operationalization by the UNDP (1997, 2005) marks an important progress, where 'human poverty indices' are computed as the weighted average of longevity, knowledge, decent standard of living, and social exclusion (this last one only in case of OECD countries).[2] Yet, it does not sufficiently capture each of the important dimensions suggested by the international poverty research.

Wagle (2002) develops a comprehensive multidimensional framework incorporating economic well-being, capability, and social inclusion[3] as multiple dimensions of poverty and examines the deprivation of households in Kathmandu, Nepal (Wagle, 2005). At first, this framework is somewhat fuzzy and all-encompassing, attempting to 'fish all possible suspects.' In reality, however, poverty is increasingly conceived as a latent concept that has never been defined precisely neither has there been a single, commonly agreeable proxy indicator to gauge it. There is, therefore, a sense of urgency to come up with innovative approaches to help policymakers accurately measure poverty and better target resources.

Traditionally, economic well-being has been the most central focus of poverty research predicating on that poverty results from a lowness or inadequacy of income or consumption (Iceland, 2003; Orshansky, 1965; Weinberg, 1996; Wagle, 2006). There are continuing arguments over the appropriateness of consumption or income as the proxy measure since consumption tends to be higher in the beginning and later periods of life and income tends to be higher in the middle period of life (Haveman, 1987; Johnson et al., 2005). While the notion of permanent income helps even out the differences in the long run, it is largely impractical given the difficulty of predicting one's lifetime earning potential, dependent on myriads of life options and choices. It is a matter of practicality to develop poverty lines focusing on basic consumption and yet use income as the yardstick to determine poverty status (Citro and Michael, 1995; Dalaker, 2005; Iceland, 2003; Joassart-Marcelli, 2005; Orshansky, 1965; Summer, 2004). There are also issues regarding applying the absolute, relative, or subjective cutoffs to distinguish the poor from the non-poor. The absolute and relative criteria are highly interconnected, however. The official poverty lines in the United States and elsewhere, developed by weighing in the consumption needs of some bottom portions of the population, necessitate timely overhaul to reflect the changes (Citro and Michael, 1995; Fuchs, 1965; Glennerster, 2002; Short, 2001; Summer, 2004). The subjective criterion, too, is intertwined with the relative one, as people's views on the appropriate minimum living standard depend on the relative position of society (Brady, 2003; Hagenaars, 1986; Stewart, 2006; Townsend, 1979; Wagle, 2007).

Notwithstanding these issues, the chief guiding principle for poverty measurement in the US has been to identify whether one has the economic well-being[4] or resources needed to secure a decent living standard (Johnson et al., 2005; Iceland, 2003). Proponents of the capability approach challenge this thesis, arguing that poverty or a lack of human well-being can result from a number of factors, with one being the low or inadequate economic well-being. From this perspective, more fundamental than economic well-being is the

[1] See, for example, Adelman and Morris (1967, 1973), Bourguignon and Chakravarty (2003), Chakravarty (1983), Deutsch and Silber (2005), Dewilde (2004), Moisio (2004), Morris (1979), Tsui (1999, 2002), and Whelan et al. (2002).

[2] Because the purpose is to compute the HPI for individual countries, the UNDP uses the percentage of people not expected to survive to age 40 as the proxy for longevity, the percentage of adults who are illiterate as the proxy for knowledge, and the percentage of people without access to safe water, percentage of people without access to health services, and percentage of moderately and severely under weight children under five as the proxies for decent standard of living. While the UNDP continues to use this approach to compute the HPI for developing countries (without the percentage of people without access to health services), it uses a slightly different approach for the OECD countries. For these countries, the HPI is computed as the unweighted average of four separate measures including the probability at birth of not surviving to age 60, the percentage of adults lacking functional literacy skills, the percentage of people living below the poverty line (defined as the 50 percent of median adjusted household disposable income), and long term (over 12 months) unemployment rate (UNDP, 2005).

[3] While social exclusion is widely accepted as a standard term, 'social inclusion' is used here providing a positive order of measurement, consistent with those of economic well-being and capability.

[4] 'Economic well-being', which indicates economic 'health' or 'soundness', is not necessarily the best term to capture this strand of poverty research. The distinction needs to be clear between economic well-being and the general human well-being as the latter indicting the overall quality of human life constitutes the end, with the former being a means to achieve it. I use the term economic well-being, despite this terminological issue, to be consistent with the existing literature.

capability or the freedom needed to achieve important 'functionings' and lead to the life or lifestyle one values and has reason to value (Alkire, 2002; Sen, 1992, 1993, 1999, 2000; UNDP, 2000a,b). Linking with positive notions of freedom, this approach has essentially broadened the concept of poverty suggesting that it is a manifestation of inadequate human well-being (Alkire, 2002; Clark, 2005; Gasper, 2002; Jayasuriya, 2000; Nussbaum, 2000, 2006; Pelletiere, 2006). Both capability and functionings can have instrumental and constitutive values, with the cross-cutting nature of basic capability sets including education, health, nutrition, gender equality, and self-respect, making them the most fundamental aspects of freedom[5] (Alkire, 2002; Hicks, 2004; Sen, 1992, 1999; Wagle, 2002). Capability can also be absolute or relative with Sen (1992, 1993, 1999) arguing for the absolute minimum capabilities and others including Nussbaum (2006) arguing for the relative capabilities with variability across contexts.

Albeit widely embraced internationally, this capability notion of poverty has not seen much theoretical or practical implication in the US. Somewhat related is the concept of relative deprivation developing in the sociology literature (Stewart, 2006; Coleman, 1990; Walker and Smith, 2002). The notion of relative deprivation capturing the individual frustration or unsatisfying emotional experience relates to the concept of relative capability with commonalities in how individuals perceive their position in society. In fact, the essentially psychological nature of relative deprivation can help fill the vacuum that may exist in the capability literature.[6]

Social inclusion is yet another canon used to analyze poverty postulating that social institutions and processes dictate how one fares in society. Poverty status, here, is a function of one's relationship with the broader society especially as manifested in the degree of integration (Cannan, 1997; De Haan and Maxwell, 1998; European Foundation, 1995; International Institute for Labour Studies, 1996; Silver, 1994, 1995). Some people are excluded, by virtue of their membership to certain groups, effectively denying the opportunity to attain economic resources or capability and creating a complex vicious cycle. This concept originally developed in Europe awaits theoretical refinement and broader empirical usage (Davies, 2005; Oyen, 1995; Sen, 2000; Silver, 1995). But central to one's meaningful integration is the participation in the labor market or the economy, political systems and governance, and civic and cultural milieus (Gough and Eisenschitz, 2006; Lister, 2004; Littlewood and Herkommer, 1999; Strobel, 1996; Wagle, 2005; Witcher, 2003). These are integral components of relational well-being and research supports a highly positive reinforcement between poverty and social exclusion (Figueroa et al., 1996; Gore and Figueiredo, 1997; Lister, 2004; Wagle, 2005).

Although the 'urban underclass' and 'social isolation' theses debated in the US closely resemble the European version of social inclusion, specific treatments vary. Following the 'culture of poverty' debates of the 1960s, some view the increasing joblessness especially of the urban black males as the consequence of a lack of individual responsibility, deviant behavior, and poor investment in human capital (Mead, 1986, 1992). Other expositions, more in line with the concept of social inclusion, focus on social pathologies. From this perspective, a lack of manufacturing and low skilled jobs and urban flight from major cities in the 1970s and 1980s caused the poorly trained, jobless blacks to be left behind thus isolating or excluding them from the important social mechanisms including churches, schools, and neighborhoods (Rankin and Quane, 2000; Wilson, 1987, 1996). But while the poor may embrace a different set of norms and practices, it is arguably a survival strategy that cannot be avoided without broader policy frameworks to meaningfully integrate them in the mainstream processes (Gans, 1995; Stack, 1974).

These three strands of research underscore the closely related aspects of poverty and human well-being, with comprehensive, person and institution centric concepts.[7] It is precisely for this reason that the degree or intensity of poverty experienced and the likelihood of attaining a decent human well-being clearly are functions of all three dimensions (Wagle, 2002, 2005). Accepting the centrality of these arguments, this paper

[5] Because of their fundamental nature, some proponents view them as basic entitlements to the extent that they must be universally available (Nussbaum, 2000, 2006).

[6] Critics charge that the capability notion of human development fails to account for the cognitive and psychological aspects that play important roles in poverty research (Clark, 2005; Gasper, 2002).

[7] For Sen (1999, 2000), for example, the concept of capability incorporating notions of 'freedom' and 'choice' goes well beyond the concept of poverty and social inclusion. For others, including De Haan and Maxwell (1998), International Institute for Labour Studies (1996), and Silver and Miller (2003), social inclusion has a much broader appeal determining the environment that makes one poor or non-poor.

examines poverty in the US from a multidimensional perspective. Using data from the 2004 General Social Survey, the task here is to identify poverty status of individuals and compare the measurement outcomes with those from the conventional poverty standards. In so doing, it identifies the size and characteristics of the different categories of the poor so that the available policy resources can be directed at appropriate groups. Next section develops the model with context, data, and hypotheses discussed in the following section. Section 4 estimates the multidimensional model and reports results. Section 5 provides measurement outcomes while Section 6 identifies characteristics of the various categories of the poor. The final section concludes.

2. The multidimensional approach

Rather than viewing poverty as a result of a lack or lowness of single resource variable or trait, the multidimensional approach weighs in a more comprehensive set of information. Whereas economic well-being, capability, and social inclusion are treated as poverty indicating proxy concepts, this approach incorporates all three as separate dimensions of poverty. Although these dimensions are highly interrelated, a lack of perfect predictability indicates the urgency for using all three. The measurement outcomes from this approach would be more comprehensive and accurate than those from any unidimensional approach. While the notion of 'poverty gap' used in the literature indicates the difference between the poverty threshold and one's poverty score using income as the indicator, it fails to account for any potentially relevant information from other dimensions of poverty. Although the necessity of collecting comprehensive data as well as the complexity of aggregating them, thus causing potential loss of information, renders the multidimensional approach less practical for immediate application, further conceptual and methodological refinements would mitigate these issues.

Operationally, poverty status represents one's locus on a three-dimensional space, with those falling on different elements of the space experiencing different degrees of poverty. As shown in Fig. 1, people are 'poor' when they fall in any of the three oval spaces. As such they may be economic well-being poor, capability poor, or social inclusion poor depending on the element in which they fall. They would be considered 'very poor' if fallen in a combination of any two elements. Because they experience poverty on two dimensions, the likelihood of escaping it would be very slim. The story of those falling at the core would be even more serious with virtually no prospect for escaping it; hence their status identified as the 'abject poor.'

A more systematic operationalization would involve multiple steps. Let $\boldsymbol{\eta}_d \ni \eta_{di}$ be the vector of the scores of the ith person on economic well-being, capability, and social inclusion and η_d^* be the vector of the thresholds

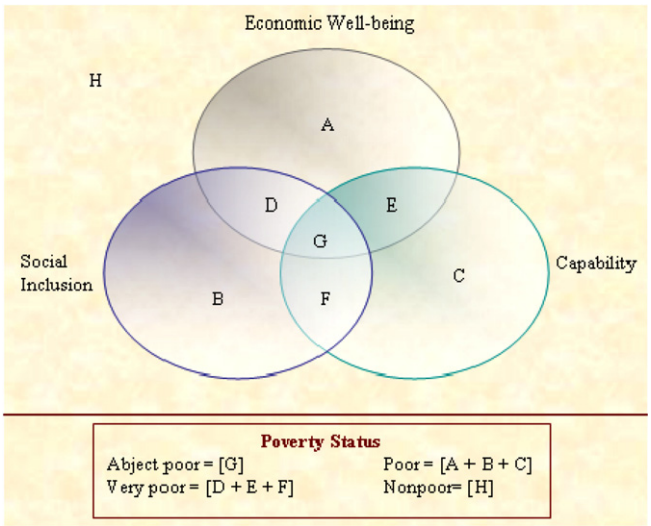

Fig. 1. The multidimensional poverty space.

of the three dimension scores. Poverty status, P, of the ith person on each of the three dimensions using unidimensional framework can be identified as:

$$P_{di} = 0 \text{ (or non-poor) if } \eta_{di} \geqslant \eta_d^* \text{ and}$$
$$P_{di} = 1 \text{ (or poor) if } \eta_{dki} \prec \eta_{dk}^*$$

In the multidimensional space, the (overall) poverty status score, S, is an aggregate of the three sets of poverty status:

$$S_i = \sum_{k=1}^{3} P_{di} \tag{1}$$

Evaluating the following criteria in turn can identify the multidimensional poverty status, M, for the ith individual:

$$\begin{aligned} M_i =& \text{Non-poor, if } S_i = 0; \\ =& \text{Poor, if } S_i = 1; \\ =& \text{Very poor, if } S_i = 2; \text{and} \\ =& \text{Abject poor, if } S_i = 3 \end{aligned}$$

It is important to note, however, that this scheme assumes equivalent weights amongst each of the three poverty dimensions. Should there be reason to believe that some of the poverty dimensions are more important, S_i would be estimated using an appropriate weighting scheme.[8]

Because this derivation starts with a given set of poverty dimension scores, it is important to develop a model that provides us with the η_d for each individual. For all three dimensions, estimates of η_d would depend on their indicator sets, Y_{dki}, which are the truly observable variables for each individual. Algebraically, for each poverty dimension:

$$\eta_d = \sum_{k=1}^{K} \lambda_{dk} Y'_{dk}, \forall d : (d = 1,\ 2,\ 3) \tag{2}$$

where Y'_k is the normalized distribution and λ_k is the weight or coefficient applicable to each of the K indicators. Because the η_d's interact with each other as the dimensions are highly interrelated signifying one dimension's potential (positive) effect on another and because the resulting dimension scores are only estimates essentially involving some errors, it is important to come up with a formal model that efficiently handles these issues. With $\mathbf{y} \ni Y_{dk}$—*a* vector containing indicator sets of each of the poverty dimensions—$\boldsymbol{\eta} \ni \eta_d$ can be estimated using the following structural equation model:

$$\boldsymbol{\eta} = \boldsymbol{B\eta} + \boldsymbol{\zeta} \tag{3}$$
$$\boldsymbol{y} = \boldsymbol{\Lambda\eta} + \boldsymbol{\varepsilon} \tag{4}$$

Where ζ represents the error in equation and $\boldsymbol{\varepsilon}$ represents the vector of errors in measurement of the dimension indicators, Y_{dk}'s. The latent variable Eq. (3) specifies the causal relationships among the (poverty) dimensions and the measurement Eq. (4), resembling a multivariate regression model, specifies the relationships between (poverty) dimensions and their indicators. With the integration of factor analysis and multivariate regression, this model requires estimating poverty dimensions using the associated indicators and their interrelationships. The model estimates the free parameters contained in each of the $\boldsymbol{\eta}$, $\boldsymbol{B}$, $\boldsymbol{\zeta}$, and $\boldsymbol{\varepsilon}$ matrices so that the difference can be minimized between the covariance matrix it implies given the specifications and the covariance matrix based on the observed data (Bollen, 1989).

Given the diverse components of the social inclusion dimension including economic inclusion, political inclusion, and civic/cultural inclusion, it is appropriate to operationalize these as separate (sub)dimensions.

[8] Rather than identifying poverty status on each dimension, in this case, the dimension scores would have to be weighted prior to aggregation. The aggregate poverty score, $C = \sum_{d=1}^{3} \eta_d W_d$, where W's are the relative weights. The score C would then have to be evaluated using some predefined rule to derive poverty status.

In the remaining part of the analysis, therefore, the actual number of dimensions included in the $\boldsymbol{\eta}$ vector will be five, not three as specified originally, with separate sets of indicators applicable to estimating each dimension.[9]

3. Context, hypotheses, and data

The US has witnessed an elevated level of research and policy attention to poverty and other burning social problems since the 1930s and especially since the 1960s. Development of the official poverty line in the mid-1960s was an attempt to more systematically identify the poor applying some objective criteria and target policies to address their deprivation concerns (Berrick, 2001; Haveman, 1987; Orshansky, 1965). There have been continuous efforts to improve the way poverty is measured, with annual cost of living adjustments to the official poverty lines and attempts to overhaul the way the poverty threshold is calculated being some examples (Citro and Michael, 1995; Short, 2001). Despite this, however, critics charge that the US has historically paid less attention to inequality and innovative approaches to understand poverty than its counterparts in the developed world (Berrick, 2001; Brady, 2003; Glennerster, 2002). Result has been rising inequality and attenuated and also mis-targeted social policy attempts (Glennerster, 2002; Smeeding, 2005).

While the rest of the world and especially Europe have moved well beyond the traditional absolutist poverty measurement approaches,[10] the US has seen these new developments limited to academic exercises. With such popular expositions as 'culture of poverty,' 'welfare dependency,' 'deviant behavior,' and 'underclass' so engrained in the everyday lexicon, more comprehensive analytical trajectories have yet to convince policymakers for their meaningful adaptation (Brady, 2003; Osberg, 2000).

As Summer (2004) accurately points out, one must realize that comprehensive analytical approaches necessitate more comprehensive databases, which are often difficult to come by. At the same time, however, the extensive amounts of longitudinal as well as cross-sectional data collected in the US suggest enormous potential for comprehensive poverty research. As Osberg (2000), Glennerster (2002), and Brady (2003) observe, for example, researchers in the US need to broaden the scope of poverty research utilizing the massive stock of existing data. This would help to more accurately understand the complex mechanics of poverty.

Using data from the General Social Survey conducted in 2004 by the National Opinion Research Center, this paper attempts to create a comprehensive picture of poverty and human well-being for the entire country by replicating a multidimensional approach successfully applied elsewhere. Given that poverty can take many forms or is jointly determined by one's status on multiple dimensions, I hypothesize significant interrelationships among these poverty dimensions. Consistent with Wagle's (2005) findings in Kathmandu, I expect that capability would be at the center of the entire poverty analysis, positively affecting both economic well-being and social inclusion. Given the cultural and other contextual differences between Nepal and the US, however, I also expect a significant, positive role of economic well-being in determining both capability and social inclusion. In process, I will assign each case in the data with an estimated score on each poverty dimension. This in turn will form a basis for further analysis involving identification of the various categories of the poor. This will also allow identification of the demographic characteristics of these categories. While the characteristics of the poor identified here may be largely consistent with those from the income- or consumption-based approaches, I expect that poverty status of some groups will turn out to be more robust under the multidimensional approach.

The General Social Survey provides a genuinely comprehensive database to investigate important economic, political, social, and other issues in the US. These data, regularly collected from a large, nationally representative sample of respondents, have been instrumental in examining cross-sectional or temporal trends in society. I draw data on a number of important variables from this 2004 dataset and aggregate many of them into some conceptually and methodologically coherent form (see Table A1 in Appendix A for a description of

[9] This will necessitate aggregation of the three sets of social inclusion dimension scores for further analysis. Because the scores will be normalized with a mean of zero, they can be aggregated by taking a simple average of the three scores for each individual.

[10] The UK government, for example, has shown commitment to systematically curtail social exclusion by adopting definitive policy measures (Davies, 2005; Lister, 2004; Social Exclusion Unit, 2001; Lister, 2004). This has also been common in the rest of Europe (Glennerster, 2002; Littlewood, 1999; Mayes et al., 2001; Whelan et al., 2002) as well as Canada (Crawford, 2003; Toye and Infanti, 2004).

variables). While using more information would be desirable, an exceedingly large number of variables typically adds to the complexity of the analysis. Additionally, data derived from general-purpose surveys like the GSS do not often supply the exact information needed for specific analyses such as this. Therefore, considerable data constraints exist, limiting the scope of this analysis.

Another issue remains critical concerning missing values. As indicated in Table A1 (in Appendix A), a number of variables have missing values. In these cases data are imputed using regression of the variable under consideration against socio-demographic predictors.[11] Since this process presumes 'data missing at random,' potential bias exists especially if there is a non-stochastic component in the missing data. While an alternative to regression imputation to handle missing data would be 'list wise deletion,' this does not appear to be a viable option, as it would result in no observation with complete information.

Admittedly, the dataset does not provide all the information necessary to precisely measure each poverty dimension. But the use of multiple indicators makes the potential repercussions less severe. Also, whether or not variables are appropriate indicators of the associated poverty dimensions is determined by seeking theoretical guide, especially from Wagle (2005) with appropriate contextual modifications, and empirical guide involving factor analysis.[12]

The resulting dataset includes the following indicators. First, the indicators of economic well-being include respondent's income, equivalized family income, and satisfaction with the given financial situation.[13] Other indicators ideal for inclusion would be levels of consumption and subjective views about the adequacy of income to meet household consumption,[14] for which data are unavailable. Second, I use educational attainment, condition of health, level of respect obtained at work, occupational prestige, and employment industry as the indicators of capability. The ideal list of variables would also include gender, ethnic, and racial disparities, nutritional level, and the level of respect enjoyed in the community (rather than simply at work). Third, I estimate economic inclusion using occupational prestige, employment industry, work status, weeks of work, and self-employed status.[15] What may have been left out, however, is the ability to access financial resources such as credit. Fourth, I operationalize political inclusion using voting in 2000 presidential election and political activism. While there can be a number of other potentially relevant indicators of political inclusion, I aggregate a number of those into the latter indicator.[16] Finally, indicators of civic/cultural inclusion include group membership, associational activity, extent of personal contacts, and participation in social activities. In this case too, other potentially important indicators such as family and ethnic ties, availability of help from families, friends, and community, and frequency of activities carried out jointly with others are not available in the dataset.

[11] This is justified since all of the important socio-demographic variables have complete data. The variables used in making such predictions include age, gender, nativity, race, marital status, household size, number of adults, number of children, number of earners, education, income, region, dwelling-type and ownership, and occupation. While not all variables would turn out to be significant in all cases, I use a consistent set of predictors as it would not lead to more or less biased predictions. Because the original set of the indicators being imputed contains discrete values, I recode the imputed values to gain consistency.

[12] In each case, exploratory and confirmatory factor analyses (results not shown) are conducted involving single factor in order to get an idea of whether or not the hypothesized commonalities are evident in each group of indicators. Factor analysis is a useful data reduction and analysis technique when the question involves estimating a common factor. The individual factor analysis models are then integrated for the more comprehensive structural equation model.

[13] I used both respondents' and family income with the assumption that there are qualitative differences between having income from a single earner or multiple earners even for a given amount of income. Also, family income has been equivalized to more appropriately accommodate the effects of family size on sharing income due to economies of scale. Consistent with Citro and Michael (1995) and Short (2001), I equivalize family income using $Y_i^* = \frac{Y_i}{(X_i)^{\frac{1}{2}}}$, where Y_i^* is the equivalized income, Y is the actual family income, and X is the family size.

[14] Economic well-being includes objective and subjective notions as it deals with the adequacy of economic resources as well as one's views regarding their adequacy (Wagle, 2007).

[15] While occupational prestige and employment industry are used as indicators of both capability and economic inclusion, these uses are conceptually as well as empirically justified. They are important indicators of both poverty dimensions as indicted by their significant factor loadings (discussed in Section 4).

[16] As indicated in Table A1, I aggregated eight different political activism variables with values of zero to three each, making the aggregated variable to take values between zero (the lowest) and 24 (the highest). Also, some other indicators such as political ideology, understanding of public and political issues, and perception of government performance were not empirically supported for inclusion (factor analysis results not shown).

4. Results

I estimate the final model depicted in Fig. 2, the generic form of which was presented in Section 2. Here, not only are the poverty dimensions measured involving multiple indicators, they are also affected by each other mimicking the interconnectedness operational in society. Also, while indicators are correlated only as mediated by the underlying poverty dimensions, three dyads of indicators—respondent's individual income and family income, education and political activism, and personal contacts and voting in 2000—are correlated directly as well as through the respective poverty dimensions.[17]

I use the weighted least squares estimator to estimate the model. This estimator is appropriate given the combination of variables with continuous, categorical, and ordinal levels of measurement and given the highly skewed data.[18] Results reported in Table 1 indicate that, while the χ^2 statistic is not significant given such large degrees of freedom, other measures including comparative fit index, Tucker–Lewis index, and root mean squared error approximation show an adequate model fit. Whereas relatively large sample sizes are often advisable in statistical analyses, structural equation models typically report poor model fit when sample size is rather large, which appears to be operational here.[19]

Since the model estimated here operationalizes poverty dimension indicators as the only variables with observed data, it is important to avoid confounding variables that may insignificantly load on the poverty dimensions. Precisely for this reason, Table 1 reports factor loadings that are all significant at 99 percent confidence level. While this operationalization may have left out some potentially relevant indicators, especially for data unavailability reasons, the set of highly significant loadings in each case reaffirms the theoretical relevance of the included indicators. Despite highly significant coefficients, some indicators appear to be more influential than others in determining the poverty dimensions.

4.1. Poverty dimension indicators

The standardized loadings reported in Table 1 and the R-squares reported in Table 2 indicate that the log of equivalized family income[20] is the most influential indicator of economic well-being, followed by the log of individual income. Since economic well-being is conceptually in closest affinity with the traditional notion of poverty, it should not be surprising to find that family income can most systematically measure one's state of economic well-being. This is justified given that individual income of the respondent, albeit relevant, is less important to measure economic well-being and that response to a question on the satisfaction over one's financial situation can be highly unpredictable due to inconsistency of its meaning across respondents.

Tables 1 and 2 also show that indicators that have the highest loadings on capability include education and particularly occupational prestige. Education cannot be overemphasized when it comes to determining capability since its entire concept revolves around staying informed and being able to make appropriate decisions (Sen, 1992, 1993, 1999; Wagle, 2005). But the finding that occupational prestige may have even greater role in

[17] This is to note that the structural equation modeling does not require these indicators to be correlated and yet I incorporate their correlations for empirical purposes especially since they are highly correlated, thus considerably improving the model fit.

[18] Where as structural equation typically uses the Pearson's zero-order correlation estimates for normally distributed, continuous data, they will lead to unreliable estimates in case of categorical or ordinal data, which often have non-normal distributions. Since many of the indicators, including financial situation, health, respect, work status, and employment industry, are either categorical or ordinal level variables, the model would need polychoric (or polyserial in case of those with continuous variables) correlation estimates. While these would be highly cumbersome to manually calculate, involving estimation of several ordered or multinomial Probit (or Logit) models and using the predicted probabilities to calculate the correlations, the MPlus software used in this analysis automatically calculates and uses them in the model estimation process.

[19] The ratio of χ^2 to degrees of freedom, a common indicator of model fit, of 13.64 reported for the model attenuates sizably when the sample size is reduced from the existing 2803 to 25 percent (or 700) randomly selected observations. The ratio of 5.11 for a model with reduced sample size, which is within the commonly acceptable range, conforms to that the overall measure of model fit may not always be reliable (Bollen, 1989, 1990). Despite this, however, I continue using the full sample size, rather than a restrictive and experimental sample size, with the expectation that the estimates produced would be more accurate. Also, while structural equation models need to be identified properly in order for the produced estimates to be reliable, use of standard software such as MPlus indicate whether the model is identified, making manual attempts identification, conventionally deemed necessary, less relevant.

[20] As happens with most econometric models, taking the natural log has produced more robust estimates with both income variables.

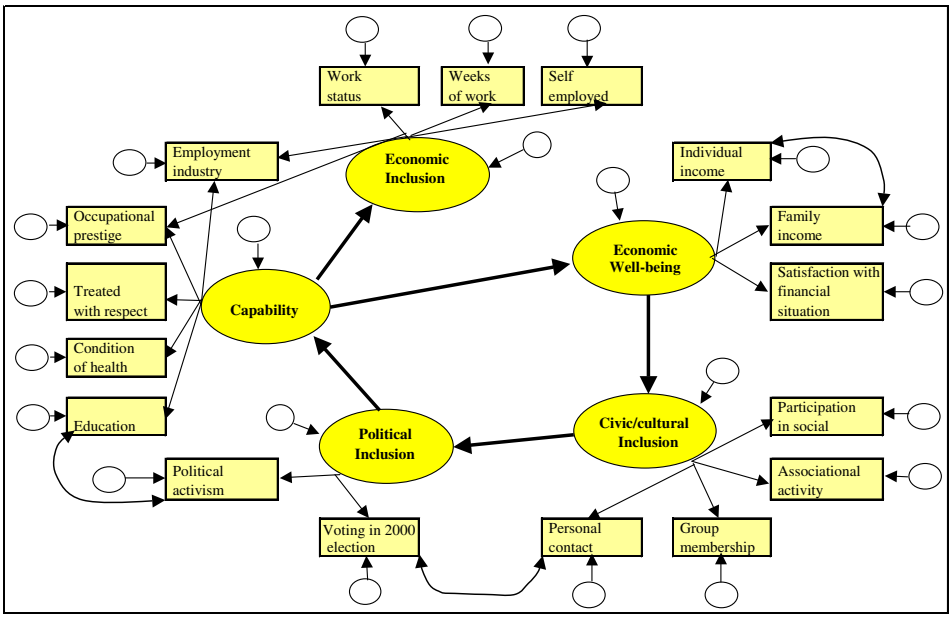

Fig. 2. The multidimensional poverty model. *Note.* (1) Squares or rectangles indicate observed variables and the ovals indicate latent concepts. (2) Blank ovals indicate errors in measurement or equation. (3) Double-headed arrows between two squares indicate correlation.

measuring capability is interesting. This is hardly a surprise, however, given the complementarities between education and occupational prestige with some of the role of the former manifested through the latter.[21] What follows is the role of employment industry that clearly aligns with the occupational prestige and the condition of health that tends to positively correlate with education. Although one of the core issues of capability is the integrity or the level of respect in the community, its less influential role may have to do with the survey seeking to measure the level of respect at work, instead of that in the community. Also operational may be the understanding of respect when it comes to assessing how others perceive them.

In partial support to the UNDP's (2000a,b, 2005) strategy to operationalize social inclusion using chronic unemployment, weeks of work and especially work status appear to have the most influential role in assessing the state of economic inclusion. While other indicators including occupational prestige, employment industry, and self-employment status that primarily capture the qualitative aspect of work also have significant roles, the suggestion that the extent of engagement in the labor market is perhaps more important is interesting. Albeit seemingly contradictory with Wagle (2005), the finding that there is less influential role of employment industry—as well as occupational prestige—in the US may have uncovered the labor market dynamics that are context specific. Additionally, this may have to do with the rather influential role of the qualitative aspect of work in assessing one's capability, thus rendering its role in terms of economic inclusion only secondary. It would be interesting to see how this would play out if other potentially important indicators as access to financial resources were to be included in the model.

Of the two indicators used to measure political inclusion, while both are important, political activism is more influential than one's participation in the 2000 presidential election. In modern democracies, adult suffrage is the most obvious way people participate in their own governance, where those failing to participate forgo the opportunity to determining their own destiny. At the same time, however, people find more direct ways of influencing policy decisions other than simply casting ballots electing their political representatives (Verba et al., 1978, 1997); hence the declining voter participation in the US. The suggestion that political activism is more important than voting itself is unsurprisingly consistent with Wagle (2005) despite contextual dif-

[21] It must be noted that the R^2 estimates of occupational prestige and employment industry do not accurately mirror the level of their influence in measuring the associated poverty dimension as these load on both capability and economic inclusion.

Table 1
Standardized loadings in the multidimensional model of poverty

Indicators/dimensions	Economic well-being	Capability	Economic inclusion	Political inclusion	Civic/cultural inclusion
Observed indicators					
Log of income	0.571*				
	(0.000)				
Log of equivalized family income	0.689*				
	(0.019)				
Satisfaction with financial situation	−0.447*				
	(0.033)				
Education		0.727*			
		(0.000)			
Condition of health		−0.478*			
		(0.010)			
Treated with respect		−0.325*			
		(0.011)			
Occupational prestige		0.866*	−0.260*		
		(0.023)	(0.071)		
Employment industry		0.559*	−0.179*		
		(0.014)	(0.048)		
Work status			0.772*		
			(0.000)		
Weeks of work			0.613*		
			(0.174)		
Self-employed			−0.281*		
			(0.069)		
Political activism				0.731*	
				(0.000)	
Voting in 2000 election				0.532*	
				(0.008)	
Group membership					0.479*
					(0.000)
Associational activity					0.345*
					(0.019)
Personal contact					0.253*
					(0.029)
Participation in social activities					−0.817*
					(0.069)
Poverty dimensions					
Economic well-being					0.408*
					(0.065)
Capability	0.622*		0.521*		
	(0.012)		(0.012)		
Political inclusion		0.474*			
		(0.025)			
Civic/cultural inclusion				0.956*	
				(0.119)	
$n = 2803$; Chi-sq = 1487; DF = 109; Chi-sq/DF = 13.64; CFI = 0.946; TLI = 0.932; RMSEA = 0.067					

Note. Values in parenthesis are standard errors.
Because loadings are standardized, loading/SE does not yield the *t*-statistic reported above.
* $p < 0.01$.

ferences, due perhaps to the more comprehensive nature of the former capturing a host of ways people participate in political activities.

Largely consistent with findings in Wagle (2005), Tables 1 and 2 show that participation in various social activities including those of professional, sports, religious, and cultural associations drives one's civic and cultural inclusion. While the membership alone in various voluntary and professional organizations and groups is

Table 2
R^2 Estimates

Indicators/dimensions	R^2
Observed indicators	
Log of income	0.326
Log of equivalized family income	0.474
Satisfaction with financial situation	0.200
Education	0.529
Condition of health	0.229
Treated with respect	0.106
Occupational prestige	0.580
Self-employed	0.078
Weeks of work	0.376
Work status	0.596
Employment industry	0.241
Voting in 2000 election	0.283
Political activism	0.534
Group membership	0.229
Associational activity	0.119
Participation in social activities	0.667
Personal contact	0.064
Poverty dimensions	
Economic well-being	0.513
Capability	0.385
Economic inclusion	0.271
Political inclusion	0.932
Civic/cultural inclusion	0.338

relatively important, maintaining wider personal contacts and perceived importance of being active in political and social associations do not mount to a powerful driving force for one's civic and cultural inclusion in society. These latter modes of participation have merit in determining civic participation (Putnam, 1993, 2000) but may not be that central in determining civic and cultural integration.

4.2. Poverty dimensions

As Table 2 indicates, the model explains the five poverty dimensions relatively well, with the variations in economic inclusion explained the least and those in political inclusion explained the most. Clearly, the explanatory power of the model does not just depend on the number of indicators or their robustness. Perhaps even more important is the robustness of the relationships specified. Yet, while the model explains over 93 percent of the variation in political inclusion, whether it is because of the well-behaving indicators or robust interrelationships is not clear.

Table 3 reports correlation estimates involving each possible dyad of poverty dimensions. Since each represents correlation between two sets of poverty dimension scores, the positive entries in all cases support the hypothesis involving positive relationships among all poverty dimensions. Neither the positive relationships themselves nor their consistency with similar studies (Wagle, 2005) should be surprising, however, as these dimensions are different manifestations with the overall human well-being as the unifying theme. Because high capability enables one to derive economic resources, a relatively large correlation between capability and economic well-being is reasonable. Correlation of these two dimensions with the three social inclusion (sub)dimensions is either moderate or moderately high, which is justified given their operationally somewhat different foci. Of these three (sub)dimensions, however, while economic inclusion has moderately low correlation with both political inclusion and civic and cultural inclusion, the latter two have near-perfect correlation. Because the correlation reflects on both correlation among the inter-dimension indicators and the interrelationships among dimensions (see below), its high estimate is quite plausible.

Table 3
Correlations among the poverty dimensions

Dimensions	Economic well-being	Capability	Economic inclusion	Political inclusion	Civic/cultural inclusion
Economic well-being	1.000				
Capability	0.855	1.000			
Economic inclusion	0.558	0.603	1.000		
Political inclusion	0.745	0.779	0.414	1.000	
Civic/cultural inclusion	0.738	0.765	0.408	0.997	1.000

Table 4
Total standardized effects[a]

Dimensions	Economic well-being	Capability	Economic inclusion	Political inclusion	Civic/cultural inclusion
Economic well-being	1.130	0.209	0.109	0.441	0.461
Capability	0.703	1.130	0.589	0.274	0.287
Economic inclusion	0.000	0.000	1.000	0.000	0.000
Political inclusion	0.333	0.536	0.279	1.130	0.136
Civic/cultural inclusion	0.318	0.512	0.267	1.080	1.130

[a] Transpose of the total standardized B matrix.

Table 1 reports the standardized coefficients on poverty dimensions that go into determining each poverty dimension. As Fig. 2 depicts, however, the actual path operational in determining poverty dimensions can be quite complex involving both direct and indirect effects. Taking these paths into consideration, Table 4 reports the total standardized effects of each poverty dimension on the other.[22] It indicates that each dimension confers at least some effect on others. In case of economic inclusion, however, it does not have any effect on other dimensions. Ideally, a dimension that incorporates effects from other dimensions and yet does not render any effect on others would be considered a result dimension. Yet, economic inclusion cannot be considered a result dimension, as it is primarily a means through which people derive resources instrumental at avoiding poor human well-being.[23]

Table 4 offers a number of important findings. First, economic well-being is largely a function of capability as one standard deviation increase in capability boosts economic well-being by 0.70 standard deviations. It is quite consistent with capability arguments suggesting that capability determines what opportunity sets and, therefore, what economic payoffs one is likely to end up with (Alkire, 2002; Sen, 1992, 1993, 1999; Wagle, 2005). The roles of political and civic and cultural inclusion, however, are small but consistent with each other indicating that they have moderately low levels of relationships with economic resourcefulness. Unlike a complete lack of effects found in Kathmandu (Wagle, 2005), this analysis supports that those with wider participation in political and civic and cultural activities can expect a relatively higher level of economic well-being, an explanation consistent with the notion of urban underclass or social isolation (Rankin and Quane, 2000; Wilson, 1987, 1996).

Second, unlike in Kathmandu where capability was determined independent of other dimensions (Wagle, 2005), this analysis suggests that it is partly a function of political and civic and cultural inclusion. While whether or not participation in political and civic and cultural activities help derive more extensive capability endowments is debatable as these endowments including education and respect are developed over a long period of time, this moderate effect of active participation in political and civic and cultural systems makes the

[22] Total effects represent the change in η_i associated to a unit change in η_j. These effects are computed directly from $\eta = B\eta + \varsigma$ by using $[I - B]^{-1}$ where I is the identity matrix and excluding the ς vector which cannot be estimated precisely after all. Note that the effect of one dimension on itself is not necessarily unitary in Table 4 as some of the effect systems become dynamic, rather than static, involving multiple iterations of effect determination. Also, all total effects are statistically significant as the individual effects that were used in computing the total effects are statistically significant at 99 percent confidence level.

[23] While the process has been purely empirical, this result is not consistent with Wagle (2005). Partly it may be a reflection of the contextual dissimilarity as to what extent and how qualitatively one participates in the labor market may not have any systematic effects on the level of material resources, capability, political participation, or civic life. One can be reasonably skeptic, however, as the data captured may not have been complete (my suspicion) or may have behaved differently.

complimentarity between capability and social inclusion even more compelling (Sen, 2000). The role of economic well-being in determining capability is rather negligible, however, as one standard deviation increase in economic wellbeing can augment capability by only 0.21 standard deviations.

Finally, results concerning the three social inclusion (sub)dimensions suggest that economic inclusion is primarily a function of capability, political inclusion is a function of economic well-being and especially civic and cultural inclusion, and civic and cultural inclusion is to a degree a function of economic well-being. A strong role of capability in determining economic inclusion is consistent with Wagle (2005) but there is some evidence for the role of political and civic and cultural inclusion in the US, which coincide with the somewhat attenuated role of capability. Because of the low overall political and civic and cultural inclusion especially for certain groups, those with wider participation appear to stand out in terms of inclusion in the labor market and economic opportunities (Wilson, 1987, 1996; Coleman, 1990). When it comes to determining political inclusion too, the dominant roles of economic well-being and especially civic and cultural inclusion endure contextual variations. While the feeling of civic and cultural belongingness appears to overwhelmingly support political participation, those with more extensive material resources are also more likely to participate in political systems. The context does make a difference in terms of the role of capability as, unlike in Kathmandu, wider sets of capability endowments do not automatically render people politically more participatory. Although the findings are consistent regarding the dominant roles of economic well-being and capability in determining civic and cultural inclusion, magnitude of the effect of capability is drastically smaller in the US. As such, whether or not people are integrated civically and culturally is partly a function of their material resources which are needed to sustain their participation (Rankin and Quane, 2000). Albeit consistent with the dynamics in Kathmandu (Wagle, 2005), it is surprising to observe that, despite almost 100 percent correlation between political and civic and cultural inclusion, these two have a unidirectional effect from civic and cultural inclusion to political participation and not vice versa.

This complex web of relationships substantiates the overall thesis of multidimensional poverty. While not all poverty dimensions affect every other dimension and while the effects of some dimensions are smaller than those of others, this provides empirical support to the mostly theoretical arguments for the multidimensionality of poverty with dimensions representing different aspects of human well-being (Figueroa et al., 1996; Gore and Figueiredo, 1997; International Institute for Labour Studies, 1996; Gore et al., 1995; Sen, 1992, 2000; Wagle, 2002). In partial support to Wagle (2005), this analysis suggests that capability is central to determining one's status in economic well-being and economic inclusion in the US. There is even qualitatively more compelling evidence that civic and cultural inclusion significantly contributes to capability and especially political inclusion. Yet, given that economic inclusion, political inclusion, and civic and cultural inclusion essentially are the (sub)dimensions of social inclusion, this analysis supports the hypothesis that capability may be central to the entire analysis of multidimensional poverty in the US.

5. Identifying poverty status

Given that the poverty dimensions constitute different manifestations of human well-being, the estimated dimension scores can be used to identify poverty status of individuals. As such, there would be multiple poverty statuses identified for people, which may or may not conform to each other. Yet, as suggested in Section 2, the point of departure would be to identify poverty status on each dimension. Since the model estimated three sets of social inclusion (sub)dimension scores, it is important to aggregate these scores into the social inclusion scores. While the scores could be aggregated by applying a weighting scheme, consistent with the relative importance of each social inclusion (sub)dimension, I will aggregate them by taking their simple average.[24]

Identifying poverty status of individuals can be controversial even when it is based on a comprehensive set of information. Unlike with income, consumption, or educational attainment, for example, these scores do not

[24] This is assuming that all dimensions have equal weight. In reality, people may value any of the economic, political, and civic and cultural inclusions more dearly than others, as it may be more relevant to determining one's relational well-being. To attain conformity for aggregation, however, I have changed the values of some dimension scores keeping the overall distribution intact. Results are summarized in Table A2 in Appendix A.

Table 5
Multidimensional poverty outcome based on different targets (values are percent; $n = 2803$)

Poverty categories	10% Target	30% Target
Non-poor	83.09	58.87
Poor	7.78	11.88
Very poor	5.14	9.56
Abject poor	4.00	19.69
Total	100	100

manifest some immediately sensible units of measurement. Since the poverty dimension scores produced by the model are error-free, they are most useful to identify the relative positions of people (Brady, 2003; Fuchs, 1965, 1967; Townsend, 1979).[25] Irrespective of the procedure, however, what poverty line or threshold to use is political as is already the case with income or consumption.[26] From policy standpoint, it is more useful to think of the line in terms of the target population that the policy attempts to address. Consistent with Wagle (2005), I use the relative notion of poverty with the assumption that between 10 and 30 percent of the population are poor.[27] These targets are quite realistic given that over 12 and 31 percent of the US population were identified as poor in 2004 using 100 and 200 percent of the official poverty lines (Census Bureau, 2005).[28]

Table 5 estimates the population in each poverty category following the procedure set out in Section 2. Application of the 10 percent target on each poverty dimension identifies four percent as the abject poor, five percent as the very poor, and eight percent as the poor.[29] If this target were to increase to 30 percent, on the other hand, the size of the abject poor would expand to 20 percent, the very poor to 10 percent, and the poor to 12 percent. Two sets of explanations are in order. First, the three categories of the poor experience different degrees of poverty. The abject poor, for example, are poor on all three dimensions. This group is actually the hardcore poor population that has the least likelihood of escaping poverty. It may come close to what many identify as the 'chronic poor' (Hulme et al., 2001; Hulme and Shepherd, 2003; Metha and Shah, 2003), which is a prolonged variant of poverty. Given the interconnectedness among the poverty dimensions, however, the systematic processes and outcomes in society may make it more difficult for the abject poor to escape poverty than for the chronic poor who may have fallen back as a result of some negative (financial) shock (Amis, 1994; Baulch and Hoddinott, 2000). Clearly, this group needs the most extensive policy resources and attention to

[25] Even in terms of absolute poverty, there are ways to assess which value in the distribution corresponds to some commonly agreeable poverty threshold applicable to each of the indicators used. To establish a capability poverty threshold, for example, one would have to decide what level of each of the education, health, respect, occupational prestige, and employment industry, or a combination, signifies poverty. The capability dimension score corresponding to these absolute thresholds would then constitute the poverty line. This would essentially involve massive value judgments, however.

[26] The existing income-based poverty lines are arguable political (Glennerster, 2002). In the 1960s, for example, the official poverty line in the US was set out to be approximately one-half the median income, which by the 1990s was reduced to one-third. With growing housing, transportation, insurance, and childcare costs, even those focusing on income or consumption-based poverty thresholds propose divergent arguments over the actual poverty threshold (Citro and Michael, 1995; Dalaker, 2005; Joassart-Marcelli, 2005). As for the relative approach, on the other hand, whether to use 50 or 60 percent of the median income as the poverty line is debatable. While almost all European countries now use 60 percent standard, the UK uses the 50 percent standard for its official purposes.

[27] Although these are relative scores, their error-free distribution disallows the use of conventional median value-based relative cutoff points. This is precisely the reason behind Bollen's (1989) suggestion to refrain from making further analysis involving the absolute values of the predicted scores. Also, using a uniform set of poverty target across all dimensions may not be very realistic. Just because between 10 and 30 percent were economic well-being poor at a given time does not mean that the equal size of the population would be capability or social inclusion poor. It is assumed only for illustrative purposes and for the purpose of carrying out sensitivity analyses in terms of estimating the size of different categories of the poor.

[28] Using census data, Danziger and Gottschalk (2005) estimated the population below official poverty line to be close to 10 percent in 1999. While more recent approaches experimented by the Census Bureau (2006) provide a variety of measurement estimates including those that are as low as slightly over eight percent, these are yet to be formalized as the official poverty lines used for governmental purposes.

[29] These are non-cumulative percents indicating that the poverty population under the 10 percent target would total 17 percent including all three categories of the poor.

improve and sustain human well-being. The next group needing slightly narrower set of policy attention is the very poor as it is identified as poor on two of the three dimensions. While there may be a qualitative difference between the three forms of poverty, this group, though still at risk of being abject poor, has something to hang on. The last group being poor on just one dimension is qualitatively different from the very poor. This group may have a low level of economic well-being but it has less bleak prospect for improvement in human well-being since it is either relatively more capable or is not systematically excluded from the economic, political, and/or civic and cultural systems. This group would clearly be behind in the priority order for policy resources and attention.[30]

Second, it is interesting to observe that movements in and out of the different categories of poverty are not proportional to the poverty targets used. A threefold increase in the poverty target, for example, causes a five-fold increase in the abject poor, without changing the relative size of the very poor and the poor. Ideally, one would expect application of less-stringent poverty thresholds—i.e., higher target for poverty population—to increase the population that is not severely poor. This does not hold in reality, however, perhaps because of the strong interrelationships among the poverty dimensions so that poverty statuses on all three dimensions are somewhat predictable. And this predictability may be higher for the less-abject poor than for the more-abject poor. It may be for this precise reason that the movement from the 10 to 30 percent poverty target causes only a less than proportionate decrease in the non-poor population.

6. Characteristics of poverty

The most important implication of developing a poverty measurement approach is on identifying the characteristics of poverty. It is important to see whether, and how if any, this approach alters the stereotypical perception of the poor. The goal, however, is not necessarily to alter this picture but to be more accurate in identification. In effect, Table 6 identifies some key demographic characteristics of those who are in different categories of poverty, based on both 10 and 30 percent poverty targets. Since studies show race, gender, nativity, household size, and marital status to be important determinants of poverty, I include these characteristics, along with geographic region, and compare the results with those using the traditional approaches.

Historically, studies show that poverty is disproportionately concentrated among Blacks, Hispanics, female headed families, families with never married and widowed householders, large families, families with multiple children, and foreign-born population (Census Bureau, 2005; Dalaker, 2005; Danziger and Gottschalk, 2005; Iceland, 1997; Newman, 1999; South et al., 2005; Sawhill, 1988; Wilson, 1996). While this analysis generally supports this conclusion, there are important observations especially concerning the different categories of the poor. First, even when the 10 percent target is followed, it should not be surprising to find that this analysis estimates larger population of the poor for all racial groups, gender, and nativity and for some regions and marital statuses, compared to the estimates based on the 2004 Current Population Survey, for example.[31] Nevertheless, sizable differences exist in terms of the South region and married and widowed populations, whereas the Northeast and West regions have quite similar estimates.

Second, the Blacks, Hispanics, and especially American Indians have disproportionate concentrations of poverty. Even more striking is the finding that the percent abject poor among these groups is close to or larger than the percent poverty target, suggesting that a quite large number of these groups may have no prospect for

[30] This does not mean, however, that this group ends up with less attention. In the real world, because who gets what from policies is determined through political calculus, the most deserving poor may end up with the least amount of policy resources and attention (Berrick, 2001; Stone, 2002; Sen, 1995).

[31] These estimates were derived from the Census Bureau (2005) and Dalaker (2005). Estimates from the former were based on the official poverty lines, whereas those from the latter were based on various alternative and experimental poverty lines with geographic and inflationary adjustments as well as valuation of in-kind transfer.

Table 6
Demographics of different categories of the poor (all figures are in percentage unless indicated otherwise)

Demographics	*n*	10% Target				30% Target			
		Non-poor	Poor	Very poor	Abject poor	Non-poor	Poor	Very poor	Abject poor
Total	2803	85.52	4.42	4.60	5.46	62.29	7.96	7.10	22.65
Race									
Black	373	72.12	10.72	8.04	9.12	43.70	12.06	12.06	32.17
American Indian	26	50.00	19.23	19.23	11.54	26.92	11.54	11.54	50.00
Asian	100	83.00	8.00	5.00	4.00	58.00	17.00	8.00	17.00
Hispanic	75	72.00	10.67	8.00	9.33	45.33	6.67	9.33	38.67
White	2229	85.69	7.04	4.40	2.87	62.27	11.80	9.20	16.73
Gender									
Female	1527	80.09	9.36	5.70	4.85	54.88	12.25	10.28	22.59
Male	1276	86.68	5.88	4.47	2.98	63.64	11.44	8.70	16.22
Nativity									
Foreign-born	272	80.15	9.56	5.15	5.15	52.94	14.34	10.29	22.43
US-born	2531	83.41	7.59	5.14	3.87	59.50	11.62	9.48	19.40
Marital Status									
Never married	618	74.92	11.81	6.47	6.80	45.31	14.72	13.27	26.70
Married	1474	89.42	4.95	3.87	1.76	68.32	11.06	7.60	13.03
Widowed	203	67.00	13.30	11.33	8.37	40.39	11.82	11.82	35.96
Divorced/separated	508	81.10	8.86	4.72	5.31	55.31	10.83	9.84	24.02
Average people in households (#)									
Households size	2803	2.46	2.49	2.35	2.33	2.44	2.53	2.49	2.43
Number of children under 18[a]	869	1.85	2.14	1.74	2.09	1.82	1.92	2.00	1.94
Region									
Northeast	447	89.93	4.92	3.80	1.34	67.34	12.30	6.04	14.32
Midwest	696	85.34	6.75	3.74	4.17	58.19	12.36	10.06	19.40
South	1083	78.02	9.79	7.57	4.62	52.35	11.73	11.73	24.19
West	577	84.58	7.45	3.29	4.68	65.34	11.27	7.63	15.77

[a] For households with children.

improving human well-being without extensive policy measures. The American Indians appear to be particularly vulnerable with poverty rate at 50 percent following the 10 percent target and 73 percent following the 30 percent target.

Third, gender does make a difference, as manifested in a sizable gap in poverty rates between males and females. Following the 10 percent target, while this gap is sizable among the poor, it is consistently wider among the abject poor, indicating that much of the gender difference occurs especially in terms of the likelihood of being abject poor. Results (not shown) indicate that this has occurred as a consequence not of any particular dimension but of the overall human well-being, elevating a need for more systematic policy prescriptions to eliminate gender discrepancy.

Fourth, Table 6 shows that there is some discrepancy between poverty rates among the foreign-born and native populations across all poverty categories and especially across the poor and abject poor categories, with a lower poverty rate for the US-born population. Yet, these results do not warrant highly systematic discrepancies in the poverty rates between these groups.

Fifth, results suggest that the likelihood of being poor changes depending on marital status. Poverty appears to disproportionately concentrate on households with divorced/separated, never married, and especially widowed householders.[32] While the poverty population is distributed relatively evenly among

[32] While all respondents of the General Social Survey are not householders, some comparison is tenable because most of the respondents can be assumed to be householders just like those in the census data.

these three groups, larger percentages of the households with widowed householders are either the abject poor or the very poor, compared to other marital status groups. Similar dynamics hold for the divorced/separated and never married but to a lesser magnitude. When the poverty target increases from 10 to 30 percent, on the other hand, far greater than 30 percent appear to be either the abject poor or the very poor for all three categories other than married. This supports the picture of poverty population that has less-than perfect marital status in a 'conservative sense,[33] providing some indication for the level of policy support different categories of the poor need. Whether marital status is a cause of poverty or its consequence is difficult to vindicate, however, as those unable to afford to stay married often slip out of wedlock.

Sixth, it is interesting to find that multidimensional poverty does not depend on household size. Results provide some indication that those categorized as the poor tend to have consistently larger households and that the standard deviation of the household size is smaller for the non-poor households (result not shown). But households are scattered across different sizes, without any conspicuous pattern. A more evident pattern, instead, exists in terms of the number of children under 18 in households. Table 6 shows that households in poverty have larger numbers of children than those not in poverty and that this is truer when the 10 percent target is applied.[34] It is also interesting that the very poor tend to have the smallest number of children following the 10 percent target and the largest number of children following the 30 percent target. This uncovers a subtle dynamic within the population in poverty indicating that the abject poor do not necessarily have multiple children. While this pattern is true of the households with widowed householders, it is not true of households with never married householders (results not shown) perhaps challenging the thesis that out-of-wedlock births cause poverty.

Finally, there are regional dynamics of poverty concentration. The Northeast is especially immune with the lowest concentration of poverty, whereas the Midwest, West, and especially South have high poverty concentrations. All three regions have about one half of the 10 percent poverty target classified as the abject poor and yet the South has a much higher concentration of the very poor. Applying the 30 poverty target, the Midwest and especially the South become highly poverty stricken and the Northeast somewhat catches up with the West. It may be the urban dynamics of the Northeast and the West that lend enough support to have better human well-being for most of their populace. But just like marital status, it is difficult to disentangle the cause and effect relationship between geographic region and poverty.

7. Conclusion

Poverty measurement and research has made important progress by moving from unidimensional to multidimensional approaches. While researchers use such unconventional conceptualizations of poverty as capability and social inclusion, a promising approach has emerged by incorporating the material, inner, and relational aspects of human well-being. The resulting multidimensional approach applied elsewhere with economic well-being, capability, and social inclusion does not just assess the poverty status (Wagle, 2005). It assesses the state of human well-being by focusing on 'what one has', 'how much prospect one has',[35] and 'how much advantaged or disadvantaged one is in society' toward improving such prospect with all contributing to 'what one can have.' Although 'how much one has' is important, as it is the means by which one can acquire human well-being, poverty is a more complex social phenomenon and incorporating more information

[33] This is strictly in the sense of being in or out of wedlock and without attempting to provoke a discussion over the properties of a 'perfect' marital status.

[34] This applies to households with children only. While one could speak of the aggregate statistics also including households without children, more precise and comparable estimates are necessary to distinguish between the households in poverty and those that are not.

[35] Seemingly, this is not much different from 'what one can have.' In reality, however, how much prospect one has or what one can do is different from what one can have since the latter incorporates what the society provides. If the society systematically precludes someone from doing something or having something, for example, s/he may not have it despite the fact that s/he can do it or has the prospect to do it.

is necessary do draw its accurate picture. Moreover, this provides an important value added to more effective policy targeting by identifying the actual degree of poverty experienced.[36]

Despite this methodological progress, however, researchers and policymakers in the US have not taken full advantage of it. Whether the official poverty lines are used or other alternative approaches are experimented with (Citro and Michael, 1995; Dalaker, 2005; Short, 2001; Weinberg, 1996), the US is stuck with the old-fashioned economistic approach, with income and consumption as the only information to use. Even many seminal works around poverty (Iceland, 1997, 2003; Johnson et al., 2005; Sawhill, 1988; Smeeding, 2005; Wilson, 1987, 1996) have failed to move onto more innovative approaches that are widely used elsewhere. Rather than adopting a forward looking approach, the Census Bureau has recently introduced a new, more stringent poverty measurement scheme in an attempt to attenuate the population in poverty by one third (Census Bureau, 2006; Bernstein and Sherman, 2006). If the country is to do justice to both the taxpayers and the poor, time is ripe to reassess the state of poverty using more innovative and comprehensive approaches.

This analysis has shown that since the three dimensions of poverty including economic well-being, capability, and social inclusion are highly interrelated, their incorporation in measurement provides an important value added. Because the capability dimension deals with the prospect that one has or can do, it is perhaps the most central to what one can have, provided that the society is conducive to its achievement. While capability may be the most critical predictor of economic well-being and social inclusion, one's human well-being or poverty status also depends on what s/he already has and her/his relationship with the society allows.

Unsurprisingly, this multidimensional approach yields poverty measurement outcomes that are more comprehensive but yet largely consistent with those from other income- or consumption-based approaches. While the characteristics of the poor identified here are partly in line with other approaches, they are based on a comprehensive set of information and thus more accurate. With this, policymakers have the choice of focusing on different categories of the poor including the very poor and abject poor. Surprisingly, the very poor and abject poor are disproportionately concentrated on certain demographic groups. The Blacks, Hispanics, and American Indians, for example, are highly likely to be more severely poor as do the widowed and never married in particular. The case of females and foreign-born population as well as large households and those with multiple children does not appear to be as serious as researchers often demonstrate.

These conclusions hold across different targets for poverty population. The 10 and 30 percent targets used here represent the lower and upper bounds of poverty population based on estimates from the existing income- and consumption-based approaches. Clearly, they can be expanded or shifted depending on the perceived distribution of poverty dimension scores and the significance of each dimension in determining human well-being. This analysis using secondary data has also demonstrated that it is imperative to use appropriate indicators to measure every poverty dimension. It is true that a comprehensive approach like this necessitates a wide array of information pertaining to both the concepts and the population under consideration. Because the concept of each poverty dimension is quite comprehensive, it also needs to be operationalized by using absolute, relative, and subjective criteria (Brady, 2003; Wagle, 2002, 2005, 2007). This analysis shows that more appropriate data are necessary to come up with definitive conclusions in identifying poverty status and explaining the actual nature of interrelationships among the poverty dimensions. Also needed are the conceptual and methodological refinements of the multidimensional approach for wider and policy relevant applications.

Appendix A

See Tables A1 and A2.

[36] Sen (1995) cautions against using income as the sole basis of policy targeting, however, as it can provide an incentive for the near poor to shun work and demonstrate poor status. When social inclusion and especially capability are used as the tools for targeting, he argues, lack of incentives to lower one's status makes the case of targeting justifiable and operationally more desirable.

Table A1
Description of the indicator variables

Variables	Type	Description
Respondent's income	Continuous	Annual income; min = −$56,889, max = $130,000
Total family income	Continuous	Equivalized annual income; min = $500, max = $130,000;
Satisfaction with financial situation[a]	Ordinal	Satisfied = 1, more or less satisfied = 2, not at all satisfied = 3
Education	Continuous	Highest year of school completed; min = 0, max = 20
Condition of health[a]	Ordinal	Condition of respondent's health;excellent = 1, good = 2, fair = 3, poor = 4
Treated with respect[a]	Ordinal	People are treated with respect at work;strongly agree = 1... strongly disagree = 4
Occupational prestige[a]	Continuous	Respondent's occupational prestige score; min = 17, max = 86
Employment industry	Categorical	Respondent's industry of work; finance, insurance, real estate = 4, professional, scientific and technical services = 3, public administration = 2, construction, others = 0
Work status	Categorical	Respondent's work status; full time = 4, parttime = 3, retired = 2, house keeping = 1, others = 0
Weeks of work	Continuous	Respondent's work-weeks last year; min = 0, max = 52
Self-employed	Categorical	Respondent self-employed
Political activism[a]	Ordinal	Respondent's degree of political activism including in signing petitions, boycotting products for political reasons, participating in demonstrations, attending rallies, contacting civil servant or politician, fund raising for political or social purposes, contacting media, belinging to a political party; min = 0, max = 24
Voting in 2000 election	Categorical	Respondent's voting in 2000 presidential election; ineligible = 0, did not vote = 1, voted = 2
Group membership	Continuous	Memberships to fraternal groups, service clubs, veterans groups, political clubs, labor unions, sports groups, youth groups, school service associations, school fraternities, nationality groups, farm organizations, literary groups, professional societies, church affiliated groups, other groups, and informal groups; min = 0, max = 20
Associational activity[a]	Categorical	perceived importance of being active in political and social associations; not at all important = 1...very important = 7
Personal contact[a]	Continuous	Number of relatives or friends, excluding those at work, in contact at least once a year; min = 0, max = 500
Participation in social activities[a]	Continuous	Degree of participation in group activities in trade unions and professional associations, religious organizations, sports, leisure or cultural groups, and other voluntary associations; min = 4 (no participation), max = 16 (active participation)

[a] Indicates variables with missing values which were imputed using regression against socio-demographic variables.

Table A2
Summary statistics on poverty dimension score

Poverty dimension	Mean	SD	Min.	Max.
Economic well-being	7.016	1.494	0.000	10.964
Capability	7.016	2.296	0.000	14.359
Social inclusion[a]	7.016	2.306	0.081	14.959
Economic inclusion	7.016	2.136	0.000	11.205
Political inclusion	7.016	2.877	0.000	17.326
Civic/cultural inclusion	7.016	2.886	0.000	17.585

[a] Because no single observation obtained zero score on all social inclusion (sub)dimensions, the minimum value of the aggregate dimension score is nonzero.

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