Fordham University
Department of Economics
Discussion Paper Series

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Discussion Paper No: 2014-01
January 2014

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March 2013

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Abstract: *Objective:* This paper examines whether disability is a correlate of poverty when poverty is measured using (1) the official poverty measure; (2) the supplemental poverty measure (SPM); and (3) two newly created multidimensional poverty measures. *Methods:* Data from the Current Population Survey is used to explore the relationship between poverty and disability for each measure. Differences across disability status were tested for statistical significance. *Results:* Disability is associated with poverty, irrespective of the poverty measure under use. The gap in poverty rates between persons with and without disabilities is smaller when using the SPM as compared to the official poverty measure. The gap in poverty rates between persons with and without disabilities is highest when using multidimensional poverty measures. *Conclusion:* Working age persons with disabilities are more likely to be poor whatever the measure under use. They are a disadvantaged group in the U.S.

In the United States, persons with disabilities are more likely to be income poor or materially deprived than persons without disabilities (Brault, 2012; Burkhauser, Rovba and Weathers, 2009; Cooper, O'Hara, and Zovistoski, 2011; Huang, Guo and Kim, 2010; McNeil, 2001; Meyer and Mok, 2006; Mitchell and Burkhauser, 1990; She and Livermore, 2007), yet disability continues to occupy very little room on the poverty research, advocacy, and policy stage (Fremstad, 2009). Traditional notions of poverty narrowly focus policy responses on addressing income disparities. Poverty researchers and policymakers have recently been embracing new poverty measures that have particular relevance for re-conceptualizing how we study poverty among persons with disabilities, however. In the U.S., the National Research Council (1995), citing weaknesses in the official income-based poverty measure, recommended the development of alternative poverty measures. As a result, a broader poverty measure (the supplemental poverty measure or SPM) was implemented by the Census Bureau in late 2011 (Short, 2011). On the international stage, in research (Alkire and Sarwar, 2009) and in policy circles (OECD, 2011; Stiglitz, Sen and Fitoussi, 2009), poverty is increasingly understood broadly as a deprivation of wellbeing rather than purely as a lack of income or other financial resources (Sen 1997, 1999). This paper adopts such a lens by considering poverty as a wellbeing deprivation, a notion comprised of both material and non-material dimensions.

In particular, this paper examines whether disability is a correlate of poverty when poverty is measured using (1) the official poverty measure; (2) the supplemental poverty measure and (3) two newly created multidimensional poverty measures that incorporate a number of socioeconomic dimensions of well-being (e.g., employment, educational attainment, political participation, social connectedness). This paper provides insights to researchers and

federal, state and community-based agencies that seek to monitor and improve the wellbeing of persons with disabilities and the poor.

Background and Hypotheses

This section includes a brief review of the causal links between disability and poverty at a conceptual level followed by a concise literature review on disability and several dimensions of poverty in the U.S. There are many causal pathways whereby disability and poverty may be linked[i]. On the one hand, poverty may increase the risk of disability through several pathways, many of which are related to health and its socioeconomic determinants. Poverty may lead to the onset of a health condition that results in disability, including through health conditions whose incidence and prevalence are strongly associated with poverty (e.g., asthma), environmental exposures (e.g., unsafe work environments), and injuries. Poverty may also increase the likelihood that a health condition may result in a disability, for instance if there is a lack of health care and rehabilitation services or barriers to access to such services.

On the other hand, the onset of disability may lead to a lower living standard through adverse impact on education, employment, and earnings and increased expenditures related to disability. Mitra, Posarac and Vick (2013) note that the extent and significance of the causal links between disability and poverty is expected to vary across disability types and across geographical areas (country, region or community). Some environments may have programs to facilitate access to health care services for the poor, preventing poverty from leading to disability onset. At the same time, the particular education facilities, labor market and social protection available in a given context influence whether disability onset may lead to poverty. Thus, whether disability and poverty are causally related is an empirical question and the answer will

be context specific. The analysis conducted in this paper does not attempt to investigate the issue of causality between disability and poverty, and is instead focused on the association between disability and poverty, using different poverty measures.

We now briefly review relevant academic literature that describe and analyze the wellbeing of persons with disabilities for several socioeconomic dimensions of wellbeing as they specifically apply to the U.S. context. The dimensions of wellbeing under review below were chosen given available literature on persons with disabilities in the U.S. and on wellbeing in other countries (OECD, 2011). This is not an exhaustive list of wellbeing dimensions.

Education. Despite the passage of federal legislation that promotes better inclusion of people with disabilities in the U.S. educational system (Education for All Handicapped Children Act (Public Law 94-142); reauthorization of the Individuals with Disabilities Education Act (IDEA) of 2004 (Public Law 108-446)), people with disabilities are less likely to complete high school (Chapman et al., 2010; Data Accountability Center, 2008; Harris Interactive, 2010) and post-secondary education than people without disabilities (Newman et al., 2010; Wagner et al., 2005).

Employment. Working-age people with disabilities have significantly lower rates of employment than working-age people without disabilities (Houtenville and Ruiz, 2012). The reasons behind these differences are numerous (Burkhauser and Daly, 2011; She and Livermore, 2007), ranging from the degree of disability, to discrimination based on disability or other personal characteristics (Bennett, 2009; Bjelland et al., 2009; Burke, 1999; Burkhauser, Houtenville and Wittenburg, 2001; Carter, Austin and Trainor, 2011; Featherstone, 2009; Meade et al., 2004; O'Hara, 2004; Stapleton and Erickson, 2004; Wilson, 2002), to the lack of appropriate support infrastructures to make jobs accessible to people with disabilities (Blank et

al., 2008; deCroon et al., 2004; Linal, Huynh, and Biering-Sorensen, 2007; Ownsworth and McKenna, 2004). The relatively high non-employment among persons with severe disabilities may lead to more limited economic resources.

Economic Resources and Expenditures. Persons with disabilities have been shown to have lower *income* and thus higher income poverty compared to persons without disabilities (Brault, 2012; Burkhauser, Rovba and Weathers, 2009; Cooper, O'Hara, and Zovistoski, 2011; Huang, Guo and Kim, 2010; McNeil, 2001; She and Livermore, 2007). Persons with disabilities have also been found to experience higher levels of material hardships including challenges securing housing, medical care and food (Heflin et al., 2007; Ribar and Hamrick, 2003; She and Livermore, 2007). This is despite higher participation rates in social protection programs that primarily take the form of income support, in particular Supplemental Security Income (SSI) or the Social Security Disability Insurance (SSDI), two federal income support programs (Houtenville and Brucker, in press).

Health and Health Care. Differences in health outcomes exist between people with and without disabilities. People with disabilities have lower self-rated general health (Drum, Horner-Johnson, and Krahn, 2008; Chevarley et al., 2006), higher rates of potentially preventable secondary conditions, chronic conditions, and early deaths (Campbell, Sheets, and Strong, 1999; DHHS, 2001; Havercamp, Scandlin, and Roth, 2004; Lennox, Diggens, and Ugoni, 2000; Turk et al., 2001) and lower access to services (Chevarley et al., 2006; Harris Interactive, 2010; Wilkinson et al., 2011). People with disabilities have been found to rely more on public health insurance programs (as opposed to private insurance), which restricts benefits and limits provider availability (IOM, 2007). Finally, persons with disabilities have been shown to have higher out

of pocket medical expenditures but to be less likely to be uninsured (Houtenville and Ruiz, 2012; Mitra et al., 2009).

Political Participation. Due to differences in education, income, physical accessibility of the local environment and stigma, the political participation of people with disabilities is lower than that of people without disabilities (Clarke et al, 2011; National Organization on Disability, 2004; Schur and Adya, 2012; Schur et al., 2002; Ward et al., 2009).

Social inclusion. Social inclusion for people with disabilities may be framed as being accepted, having relationships, being involved in activities, having supportive living accommodations, being employed and having adequate support systems (Hall, 2009). Persons with disabilities have been found to be more likely to live alone and face transportation issues and are less likely to be involved in community and social activities (Harris Interactive, 2010).

Given the literature review above, persons with disabilities have been shown to be deprived along a number of dimensions. This paper attempts to shed new light on the association of disability and poverty by using three measures of poverty: (1) the U.S. official poverty measure of the Census Bureau, which relies solely on a family's income, its size, and the age of its head; (2) the supplemental poverty measure (SPM) (Short, 2011) where family resources are defined as the value of cash income from all sources plus the value of in-kind benefits such as public housing and food stamps minus necessary expenses for critical goods and services such as medical out-of-pocket costs; and finally (3) a multidimensional poverty measure whereby an individual is considered poor if he/she experiences multiple deprivations for different dimensions of wellbeing, both material (e.g. income) and nonmaterial (e.g., political participation).

The evidence highlighted earlier showing persons with disabilities being worse off in terms of income and non-income dimensions of wellbeing leads to our first hypothesis:

Hypothesis 1: Among working age individuals in the U.S., disability is associated with poverty, irrespective of the poverty measure under use.

The extent of the disability gap in poverty rates, in other words the difference in poverty rates between persons with and without disabilities, may, however, vary depending on the poverty measure under use. In considering resources, the SPM includes in-kind benefits such as Supplemental Nutrition Assistance Program benefits and housing subsidies, which people with disabilities are more likely to receive (Houtenville and Brucker, in press). Including these government transfers will boost the calculated inflow of resources to an individual, leading some (Fremstad, 2009) to suggest that the SPM would undercount poverty among people with disabilities. At the same time, under the SPM, resources are net of medical out of pocket costs which have been shown to be higher for persons with disabilities (Mitra, Findley and Sambamoorthi, 2009). It is thus unclear how the disability gap in poverty rates compares using the SPM and the official measure. Given the higher levels of in-kind program participation found among persons with disabilities, however, we propose the following as our second hypothesis:

Hypothesis 2: The disability gap in poverty rates between persons with and without disabilities will be lower using the SPM instead of the official poverty measure.

Finally, one can note that two of the measures used in this paper, the official poverty measure and the SPM, are income-based measures of poverty. Because of the wide range of social safety nets available for income support and the higher participation of persons with disabilities in such safety nets, one can speculate that poverty measures that focus on income will yield a smaller disability gap in poverty rates than other poverty measures that incorporate non-income and nonmaterial dimensions of wellbeing. This leads to our third hypothesis:

Hypothesis 3: The disability gap in poverty rates is higher when using multidimensional poverty measures instead of the SPM or the official poverty measure.

Data and Methods

Sample. We use data from the Current Population Survey (CPS), a national household survey that has traditionally been used to measure the incidence of poverty in the U.S. (Short, 2011). Every month, the CPS collects nationally representative data from approximately 112,000 non-institutionalized persons 15 years old and over. Each household is interviewed once a month for four months and then re-interviewed again eight months later, once a month for four months. We use basic monthly CPS data and data from several supplements. This study focuses on working-age individuals aged 25 to 61.

Measuring disability. To measure disability, this study uses self-reported information on sensory, functional, activity and work limitations. The CPS disability data includes six disability-related binary questions: four questions on sensory and functional limitations (limitations in seeing, hearing, walking or climbing stairs, remembering/concentrating), and two questions on activity limitations (limitation in dressing or bathing, in doing errands). We identify a person as having a sensory, functional or activity limitation if the person answers "yes" to any of these six questions. The CPS also has a long tradition of measuring disability as a work limitation in the March CPS. Each working age individual is asked if he or she has "*a health problem or a disability which prevents work or which limits the kind or amount of work?"* To test the sensitivity of our primary results to the measurement of disability, we also present results, when feasible, based on two other measures of disability: one that indicates a work limitation, and one that indicates any form of disability (a sensory/functional/activity or a work limitation).

Measuring poverty. This paper uses several measures of poverty. We first use the U.S. official poverty measure of the Census Bureau. The official poverty measure relies solely on a family's income,[ii] and is based on a set of pre-tax income thresholds, which do not include either capital gains or in-kind benefits. Thresholds vary by family size and composition (i.e. the ages of its members) (Short, 2011, 1-2). For instance, the poverty threshold for a four-person family with two children was $22,133 in 2010 (U.S. Census Bureau, 2011).

Second, we use the SPM (Short, 2011). The SPM thresholds are adjusted to the needs of different family types and geographic differences in housing costs using an equivalence scale. The SPM family resources were defined as the value of cash income from all sources plus the value of in-kind benefits such as public housing and food stamps that are available to buy the basic bundle of goods minus necessary expenses for critical goods and services including income and payroll taxes, childcare and other work-related expenses, child support payments to another household and medical out-of-pocket costs.

We also use two versions of a third type of poverty measure: a multidimensional measure that incorporates material and nonmaterial measures, developed using the dual cutoff method developed by Alkire and Foster (2011). In brief, this method counts deprivations for a set of dimensions that affect an individual at the same time. An individual is considered multi-dimensionally poor if the number of deprivations of the individual is equal or above a set threshold. For the two measures used in this study (what we have termed an *economic measure* and a *socioecopolitical measure*), individuals need to be deprived in at least two out of five dimensions to be identified as poor[iii]. Details on the calculation of this measure are included in Appendix 1. This method may be sensitive to the selection of dimensions of wellbeing and there is no guidance on how to select them. We selected dimensions based on data availability and

given the literature review conducted earlier on the socioeconomic wellbeing of persons with disabilities. The CPS contains data in eight dimensions of wellbeing that seem relevant to this study: educational attainment, employment status, food security, health insurance status, income, health insurance status, internet access, political participation and social connectedness. Given the sampling design of the CPS, it is, however, not possible to have information on these eight dimensions for the very same individuals. The CPS indeed retains a sample of individuals for four months, drops them for eight months, and retains them again for four months. For instance, individuals who answer the November supplements on voting, registration and civic engagement do not answer the ASEC Supplement in March. Hence, their work limitation status is not known. Two separate multidimensional poverty measures were thus developed to be able to utilize the data on eight dimensions of wellbeing – an economic measure and a socioecopolitical measure.

The *economic multidimensional poverty measure* contains a mix of individual, family and household level variables and is based on data from March 2011 and the prior December 2010. The following five dimensions and within-dimension deprivation cutoffs are used:

Educational attainment (March 2011 supplement): a person is considered deprived if he/she has less than a high school diploma;

Employment status (March 2011 supplement): a person is considered deprived if he/she was not employed in the past year;

Health insurance status (March 2011 supplement): a person is considered deprived if he/she is part of a family where at least one person is uninsured;

Income (March 2011 supplement): a person is considered deprived if he/she is part of a family that is poor as per the official poverty measure;

Food security (December 2010 supplement): a person is considered to be deprived if he/she is part of a household that had low to very low food security status for the past 12 months.[iv]

The *socioecopolitical multidimensional poverty measure* contains mostly individual level variables and is based on data from the 2010 October and November supplements and basic data files of the CPS. It uses the following five dimensions and deprivation cutoffs:

Educational attainment (November 2010 basic CPS): a person is considered deprived if he/she has less than a high school diploma;

Employment status (November 2010 basic CPS): a person is considered deprived if he/she was not employed in the past month;

Social connectedness (November 2010 supplement): a person is considered deprived if he/she scores five or lower on a social connectedness scale;[v]

Computer/Internet access (October 2010 supplement): a person is considered deprived if he/she is part of a household that does not own a computer or owns a computer but does not have internet access.

Political participation (November 2010 supplement): a person is considered deprived if he/she did not vote in the recent election;

Finally, for each of the above poverty measures, the relationship between poverty and disability is explored in two ways. First, people in poverty were considered as the denominator for calculations that explored the percent of people in poverty who had a disability. Second, the percentage of all persons in poverty, with and without disabilities, according to each measure, was calculated. It should be noted that, for all the indicators used in this study, the analysis will be limited to descriptive statistics only for persons with disabilities and for those without. The

differences in indicators for persons with and without disabilities will simply be tested for statistical significance using linear regression techniques.

Results

Three different samples of working age adults were used in the analyses: one for the official and SPM measures (n_1=101,052), one for the economic measure (n_2=22,195) and one for the socioecopolitical measure (n_3=47,126)[vi]. The first sample included 7,467 persons with disabilities and 93,585 persons without disabilities, which gives the disability prevalence among working age persons of 7.4%. This is in line with other estimates of disability prevalence among the working age population (e.g., 8.1% in Houtenville and Brucker (in press); 7.5% in Kaye (2010)). Compared to persons without disabilities, persons with disabilities tend to be older, are less likely to be married and are more likely to be native born and to live outside metropolitan statistical areas (MSAs). *(Sample characteristics are in Appendix A for the first sample: characteristics of individuals were similar in the three samples.)*

Table 1 shows the percent of working age people in poverty (according to each of our four measures) who have a disability. The percent of poor working age people who have a sensory, functional or activity limitation disability ranges from 17% to 19%, depending upon how poverty is measured. Disability prevalence among the poor rises with the use of a work limitation measure of disability. For instance, the share of those who are poor as per the official measure and have either a work limitation or a sensory, functional or activity limitation stands at 28%.

(INSERT TABLE 1 HERE)

Table 2 gives poverty rates by characteristic for each of the four poverty measures. These results are useful in testing our three hypotheses. First, looking across the top row, the poverty rate is two to three times higher among persons with disabilities compared to persons without disabilities, depending on the poverty measure under use, suggesting that disability is associated with poverty across all measures. For persons with disabilities, poverty rates were 29% using the official measure, 28% using the SPM, 49% using the economic multidimensional measure, and 63% using the socioecopolitical measure. In contrast, poverty rates for persons without disabilities ranged from 11% to 27%. In relation to our second hypotheses, the official measure provided a poverty rate that was significantly higher ($p<.01$) than the SPM for persons with disabilities and the gap in poverty rates between persons with and without disabilities was significantly smaller ($p<.01$) using the SPM (16 percentage points) than the official measure (18 percentage points). Of importance for our third hypothesis, larger gaps were found with the multidimensional measures than with either the official measure or the SPM. Differences in poverty between those with and without disabilities are magnified when poverty is measured as multiple deprivations. As also shown in Table 2, differences are apparent by certain subgroups of persons. Persons with lower educational attainment, persons who are black or Hispanic and persons living in female headed households appear especially vulnerable to poverty.[vii] A similar analysis as in Table 2 was conducted for older persons aged 62 and over and similar results are reached and given in Appendix 2.

(INSERT TABLE 2 HERE)

Variations in levels of employment between people with and without disabilities may have a large influence on our multidimensional measures. To explore this issue further, we re-calculated both multidimensional measures, using only the four non-employment related dimensions in each. Results are included in Table 3 along with a summary of poverty rates by disability status and specific sensory, functional and activity limitations. Rates of multidimensional poverty are more similar to either the official poverty measure or the SPM when employment is not included in the economic multidimensional measures, but rates remain higher for the socioecopolitical measure when the employment dimension is excluded. *(Appendix C shows a summary of poverty rates by different definitions of disability.)* One could argue that the multidimensional poverty measure results may be specific to the threshold used to determine poverty across dimensions. Appendix 3 gives the multidimensional poverty headcount and adjusted headcount when different thresholds are used. For the different values of the threshold, multidimensional poverty is higher among persons with disabilities. Table 3 also gives poverty rate by disability. Poverty rates vary by disability type, with persons with hearing limitations consistently having lower rates of poverty than persons reporting other types of disabilities.

(INSERT TABLE 3 HERE)

Table 4 shows poverty rates that would occur if certain factors included in the full SPM calculations were excluded. The overall SPM poverty rates, for persons with and without disabilities, are included in the top row. The poverty rates are those that are reached if the in-kind programs or expenditures listed on the left hand side would not be included as resources or

expenditures in the analysis. The exclusion of Supplemental Nutrition Assistance Program and the exclusion of subsidized housing would each increase the gap in poverty rates between working age people with and without disabilities from 15.8% to over 18%, with persons with disabilities having higher levels of poverty. In contrast, the exclusion of medical out of pocket expenditures reduces the disability poverty gap from 16% to 12%[viii].

(INSERT TABLE 4 HERE)

Table 5 gives deprivation rates for each of the dimensions of wellbeing used in the two multidimensional poverty measures, providing dimension-specific differences in deprivations between people with and without disabilities. Recall that the economic measure included education, employment, income, food security, and health insurance and that the socioecopolitical measure included education, employment, voting participation, social connectedness, and computer/internet access. For the economic measure, for all dimensions except health insurance status, people with disabilities have significantly higher rates of deprivation. No significant difference was noted for levels of deprivation for health insurance status. For the socioecopolitical measure, people with disabilities have significantly higher rates of deprivation for each of the five dimensions. The difference in deprivation rates across disability status was highest for the employment dimension in both multidimensional measures, followed by the food security and voting dimensions. Regarding employment, nearly 70% of persons with disabilities were not employed, compared to approximately 22% for persons without a disability. Thirty-one percent and 27% of persons with disabilities were found to be food insecure or non-voters respectively. *(Deprivation rates by dimension for other measures of disability give similar results and are included in Appendix B).*

Table 6 shows the average demographic and wellbeing characteristics for those below the official, SPM, and economic measure poverty rates. The data characterize individuals in different groups, in particular those who are classified as poor using one measure but not poor under a different measure. This is of particular use in understanding what groups of individuals might be accounted for by one poverty measure, but not another one. Of our largest sample (n_1=101,052), 4,213 people are considered poor using the SPM but not poor using the traditional measure, with 11% of those being persons with disability. Alternatively, of the 3,255 people who are considered poor under the official poverty measure but not under the SPM, 19% have a disability. For our economic multidimensional poverty measure sample (n_2=22,195), there were 2,196 people considered poor using both the official measure and the economic multidimensional measure, of whom 20% have a disability. In addition, there were 2,367 people considered poor using the economic multidimensional measure, but not living in poverty under the official measure. Of that 2,367, 15% were persons with disability. Given an overall prevalence of disability of 7.4%, persons with disabilities are over-represented among the economic multi-dimensionally poor, whether or not they are also officially poor. It should also be noted that among the persons with disabilities who are multi-dimensionally poor but not officially poor, more than half are food insecure (56%), close to half (42%) have less than a high school educational attainment and few (11%) work. At the same time, 29% and 16% of this group are on SSDI and SSI respectively. Finally, one can also note that persons with disabilities who are poor as per the economic multidimensional measure, but not under the official measure, account for more than one in five persons with disabilities (364 out of 1,603 in our sample).

(INSERT TABLE 6 HERE)

Discussion

Using CPS data, this study investigates the poverty status of persons with disabilities compared to persons without disabilities in the U.S. The main findings confirm the three hypotheses set out at the beginning of this analysis: (1) disability is associated with poverty for working age adults in the U.S., irrespective of the poverty measure under use, (2) the gap in poverty rates between working age persons with and without disabilities is smaller when using the SPM as compared to the official poverty measure, and, (3) the gap in poverty rates between working age persons with and without disabilities is higher when using multidimensional poverty measures instead of either the official poverty measure or the SPM. Several main findings are summarized and discussed in detail below.

First, disability is significantly associated with poverty as per the official poverty measure, the new SPM measure and the two multidimensional poverty measures developed in this paper. This finding supports the hypothesis that disability is associated with poverty in the U.S., irrespective of the poverty measure under use, and shows that persons with disabilities in the U.S. are a disadvantaged group. Overall, poverty rates for persons with disabilities ranged from a low of 28%, using the SPM, to a high of 63%, using the socioecopolitical measure. These results are overall consistent with findings of earlier studies where poverty was measured based on the SPM (Short 2011), on income (Brault, 2012; Burkhauser, Rovba and Weathers, 2009; Cooper, O'Hara, and Zovistoski, 2011; Huang, Guo and Kim, 2010; McNeil, 2001; She and Livermore, 2009), material hardship (She and Livermore, 2007).

Second, the disability gap in poverty rates is significantly lower as per the SPM (16 percentage points) than the gap found using the official poverty measure (18 percentage points)

($p<.01$). Even though statistical significance is found, the small size of the difference in the disability gap in poverty rates (two percentage point) indicates that the different adjustments that the SPM makes seem to balance each other so that in the end, the relative diagnostic of poverty across disability status remains at almost the same level, at least in 2010. In addition, the persistence of a disability gap even when using the SPM may suggest that the accounted for in kind safety net programs are not effective in substantially reducing the income differences which exist between people with and without disabilities. In the coming years, it will be important to follow poverty rates across disability status with the SPM compared to the official measure and assess if the finding of this study holds.

Third, the disability gap in poverty rates is higher with multidimensional poverty measures compared to the official measure and the SPM. This result confirms our third hypothesis that the disability gap in poverty rates is higher when using multidimensional poverty measures and suggests that income based poverty measures such as the official and the SPM may well understate the extent of wellbeing deprivation among persons with disabilities. Overall, we can propose a lower bound disability gap using the more conservative SPM (16%) and a higher bound poverty gap using the socioecopolitical multidimensional measure (36%).

Fourth, disability is significantly associated with deprivations in a wide range of social, economic and political dimensions of wellbeing. Persons with disabilities tend to have lower educational attainment, income, and levels of social connectedness and are less likely to be employed, vote, and have internet access. These results are consistent with findings of many studies that often focused on one particular wellbeing dimension (e.g., for voting Schur et al., 2012). The only dimension under study where persons with disabilities are not more deprived is health insurance status, where no significant difference was found across disability status. This

finding is likely explained by the high levels of public health insurance program participation found among working age persons with disabilities (Houtenville and Ruiz, 2012; Houtenville and Brucker, in press).

Fifth, some groups of persons with disabilities were found to be highly likely to be poor, regardless of the poverty measure, and in particular: persons with less than a high school education, blacks and Hispanics, and persons in female headed household units. These findings highlight the importance of recognizing there are many sub-populations at risk for poverty. People that belong to one or more of these at-risk populations, including the group of persons with disabilities, may face deprivations in multiple dimensions and may need a well-coordinated set of programs and services to reduce the risk of poverty.

Sixth, the role of employment in driving the high levels of poverty found with the multidimensional measures requires further consideration. Employment was most important in driving poverty within the economic measure we constructed and was less important in the socioecopolitical measure. In addition, large gaps were evident in the percentage of persons with and without disabilities in poverty who were not employed in both multidimensional measures. These findings are not surprising given how well documented disparities in employment rates between persons with and without disabilities have been. Further investigation of the interaction between employment and the other dimensions however could lead to a better understanding of how employment may be intertwined with other areas. For instance, persons who have limited social skills and little access to computers may concurrently have limited options for employment, for example. Efforts to improve social skills and expand access to computers might be successful then in improving employment participation.

Finally, multidimensional poverty is highly prevalent among persons with disabilities and is even more prevalent for the socioecopolitical multidimensional poverty measure compared to the economic measure. About half of persons with disabilities are found to be multi-dimensionally poor. One in five persons with disabilities was found to be multidimensionally poor, while considered not poor as per the official measure. This result shows that the deprivations experienced by persons with disability are not effectively captured using the typical official poverty measure and prove the need for the adoption of broader measures of poverty. Traditionally much of the research on the wellbeing of persons with disabilities has been narrowly focused on monitoring employment participation and economic self-sufficiency. While clearly important, these traditional measures do not fully capture the domains of inclusion that would allow one to adequately assess the wellbeing of working age adults with disabilities. Information on areas other than employment and economic self-sufficiency is also needed. Measures that can incorporate information about levels of community living and participation and health and function, for example, can also shed light on opportunities for improving the wellbeing of persons with disabilities in society. There have been calls both within the disability policy field and at the national level (Government Accounting Office (GAO), 2011) to develop indicator measures that can assess progress towards broad societal aims. A 2008 National Council on Disability (NCD) report, for example, outlined steps that the U.S. Department of Education's National Institute on Disability Rehabilitation and Research could take to develop and track a full set of indicators for people with disabilities (NCD, 2008). The National Core Indicators (NCI) project tracks consumer and system level measures for state developmental disability agencies (HSRI and NASDDDS, 2013). More broadly, a 2011 GAO report summarizes current efforts in the United States (U.S.) to develop key national indicators to

measure progress for the nation as a whole across multiple domains (GAO, 2011). The ability of multidimensional measures to capture the wellbeing of persons with disabilities should continue to be explored within the disability policy, advocacy, and research communities.

The limitations of our study require some discussion. First, no multivariate regression analysis was conducted given the simultaneity of disability and economic deprivation, possible measurement error for disability and omitted variables. Analysis of longitudinal data and the use of instrumental variables are necessary to address endogeneity for each indicator under use and were beyond the scope of this study. Also, this paper does not use a consumption based poverty measure as has been done elsewhere (Meyer and Sullivan, 2012) given that data on consumption (the consumption expenditure survey) does not have a disability measure. Conceptually, however, given the possible extra expenditures that may result from having a disability, such a measure may be problematic to use for persons with disabilities.

This paper points out several possible avenues for future research. In particular, the analysis above using several poverty measures could be extended to take into account the persistence of poverty and disability over time as in She and Livermore (2009). Attempts could also be made to prioritize dimensions that are more or less relevant to different groups of persons with disabilities. Given the association of disability and poverty, work is also needed to assess how the many safety net programs that affect persons with disabilities are performing and how disability and poverty policies may be changed so as to improve the wellbeing of this group.

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Appendix 1: Multi-dimensional Poverty Measurement

Dimensions are weighted: w_j is the weight of dimension j. Each individual i has a weighted count of dimensions where that person is deprived (c_i) across all measured dimensions:

$c_i = \sum_{j=1}^{d} w_j c_{ij}$ with c_{ij} a binary variable equal to one if individual i is deprived in dimension j, and zero otherwise ($0 \leq c_i \leq d$). Let q_i be a binary variable equal to one if the person is identified as poor, and to zero otherwise. A person is *identified as poor* if the person's count of deprivations is greater than some specified cutoff (k):

$$\text{if } c_i \geq k, \text{ then } q_i = 1$$

$$\text{if } c_i < k, \text{ then } q_i = 0$$

The *weighted headcount ratio* for a given population is the number of poor persons ($q=\Sigma q_i$) divided by the total population (n):

$$H = q/n$$

To capture the breadth of deprivation experienced by the poor, we compute the average number of deprivations that a poor person faces. We start by calculating the total number of deprivations experienced by poor people $c(k)$:

$$c(k) = \Sigma(q_i c_i) \text{ for } i = 1 \ldots n.$$

The *average deprivation share* is the total number of deprivations of the poor (*c(k)*) divided by the maximum number of deprivations that the poor could face (*qd*):

$$A = c(k)/(qd)$$

Alkire and Foster's (2011) multidimensional poverty measure M_0 combines information on the prevalence of poverty and the breadth of poverty, combining the headcount ratio and average deprivation share:

$$M_0 = HA = c(k)/(nd)$$

Any poverty calculation using this framework will be sensitive to assumptions used in setting weights. In this study, we assume that dimensions are equally valuable and thus $wj=1$ *for* j = 1…d. Second, this method also requires that a cutoff is set for each dimension. Deciding on a specific cutoff point is an arbitrary choice, although it can be an informed one. We selected cutoffs based on a literature review for each dimension that aims to identify if there is a commonly accepted state of deprivation for each dimension.

TABLES

Table 1: Disability prevalence (% among the poor, aged 25 to 61) in 2010

	Official Poverty Measure	Supplemental Poverty Measure	Multidimensional Poverty Economic Measure	Multidimensional Poverty Socioecopolitical Measure
Sensory, functional, or activity limitation	18.63	16.50	16.64	16.70
	(0.42)	(0.38)	(0.65)	(0.42)
Work Limitation	22.34	19.62	19.84	N/A
	(0.45)	(0.41)	(0.70)	
Any Disability	28.22	25.15	18.04	N/A
	(0.49)	(0.45)	(0.67)	

Note: Standard errors are in parentheses. N/A stands for not applicable.
Source: Authors' calculations using CPS.

Table 2: Poverty rates (% of working age persons with and without disability) for four poverty measures

	Official poverty measure			Supplemental poverty measure			Multidimensional poverty - Economic			Multidimensional poverty - Socioecopolitical		
Category	No Disability	Disability	Difference	No Disability	Disability	Difference	No Disability	Disability	Difference	No Disability	Disability	Difference
All	10.92	29.04	18.11 ***	12.26	28.04	15.78 ***	16.90	48.79	31.89 ***	26.99	62.62	35.63 ***
	(0.12)	(0.62)		(0.13)	(0.61)		(0.30)	(1.50)		(0.29)	(1.04)	
Gender												
Male	9.55	25.70	16.15 ***	11.43	26.54	15.11 ***	15.43	42.64	27.21 ***	26.20	62.63	36.43 ***
	(0.17)	(0.87)		(0.18)	(0.87)		(0.42)	(2.10)		(0.42)	(1.51)	
Female	12.22	32.22	20.00 ***	13.04	29.45	16.41 ***	18.25	54.49	36.24 ***	27.75	62.62	34.87 ***
	(0.17)	(0.87)		(0.18)	(0.85)		(0.43)	(2.08)		(0.40)	(1.44)	
Education												
< H.S.	32.37	48.86	16.49 ***	33.97	42.44	8.47 ***	76.76	95.20	18.44 ***	88.68	97.13	8.45 ***
	(0.56)	(1.53)		(0.56)	(1.51)		(1.15)	(1.53)		(0.69)	(0.85)	
H.S.	13.77	29.13	15.37 ***	15.12	27.91	12.79 ***	19.49	42.76	23.27 ***	34.79	67.40	32.61 ***
	(0.25)	(1.03)		(0.26)	(1.01)		(0.62)	(2.48)		(0.59)	(1.65)	
> H.S.	6.21	20.25	14.04 ***	7.54	21.87	14.33 ***	8.36	36.36	28.00 ***	14.60	42.85	28.25 ***
	(0.12)	(0.82)		(0.13)	(0.85)		(0.29)	(2.15)		(0.29)	(1.63)	
Race												
White	9.67	26.04	16.37 ***	10.97	26.01	15.03 ***	15.00	45.55	30.55 ***	25.77	60.48	34.71 ***
	(0.13)	(0.68)		(0.14)	(0.69)		(0.32)	(1.74)		(0.31)	(1.17)	
White, not Hispanic	7.32	24.88	17.56 ***	8.17	24.94	16.77 ***	11.52	44.12	32.59 ***	21.18	58.87	37.70 ***
	(0.13)	(0.73)		(0.14)	(0.74)		(0.33)	(1.85)		(0.31)	(1.25)	
Black	19.30	43.63	24.32 ***	19.49	37.69	18.20 ***	30.31	63.78	33.47 ***	35.72	73.95	38.23 ***
	(0.45)	(1.63)		(0.44)	(1.58)		(1.06)	(3.22)		(1.01)	(2.65)	
Asian	8.76	25.57	16.81 ***	13.11	25.22	12.11 ***	18.01	44.22	26.21 ***	25.50	63.53	38.04 ***
	(0.42)	(3.71)		(0.51)	(3.61)		(1.20)	(8.13)		(1.28)	(7.81)	
Hispanic (any race	20.93	36.34	15.41 ***	24.53	35.36	10.83 ***	44.00	60.13	16.13 ***	47.56	70.52	22.95 ***
	(0.37)	(1.78)		(0.38)	(1.71)		(0.97)	(4.14)		(0.89)	(3.12)	
Age												
25-44	13.08	33.71	20.63 ***	13.15	30.09	16.93 ***	18.61	48.11	29.50 ***	28.76	62.48	33.72 ***
	(0.17)	(1.12)		(0.17)	(1.08)		(0.42)	(2.59)		(0.41)	(1.96)	
45-61	8.30	26.89	18.59 ***	11.19	27.10	15.92 ***	14.39	49.21	34.81 ***	24.85	62.68	37.83 ***
	(0.16)	(0.73)		(0.18)	(0.74)		(0.42)	(1.82)		(0.41)	(1.23)	
Type of Unit												
In married couple unit	6.29	13.44	7.15 ***	8.18	19.02	10.84 ***	12.28	37.54	25.26 ***	22.03	51.28	29.25 ***
	(0.11)	(0.66)		(0.13)	(0.78)		(0.31)	(2.07)		(0.34)	(1.60)	
In female householder unit	22.02	42.94	20.91 ***	22.06	36.18	14.12 ***	32.13	64.89	32.77 ***	36.75	70.67	33.92 ***
	(0.36)	(1.18)		(0.36)	(1.14)		(0.93)	(2.50)		(0.70)	(1.73)	
In male householder unit	15.26	40.51	25.25 ***	16.20	34.35	18.15 ***	27.34	56.49	29.16 ***	34.87	73.68	38.81 ***
	(0.36)	(1.47)		(0.37)	(1.42)		(1.08)	(3.42)		(0.79)	(1.98)	
Nativity												
Native born	9.28	28.93	19.64 ***	9.94	27.38	17.44 ***	13.98	48.30	34.32 ***	24.41	62.53	38.12 ***
	(0.13)	(0.64)		(0.13)	(0.63)		(0.32)	(1.56)		(0.31)	(1.08)	
Foreign born	18.35	30.38	12.03 ***	22.90	36.05	13.16 ***	32.76	55.09	22.33 ***	39.03	63.62	24.59 ***
	(0.33)	(2.11)		(0.36)	(2.19)		(0.86)	(5.40)		(0.79)	(3.72)	
Residence												
Inside MSAs	10.88	28.54	17.66 ***	12.81	28.72	15.91 ***	16.90	47.54	30.64 ***	26.10	60.70	34.60 ***
	(0.13)	(0.70)		(0.14)	(0.70)		(0.33)	(1.72)		(0.32)	(1.22)	

Notes: Standard errors are in parentheses. All estimates are weighted.
* indicates that the difference in poverty rates between persons with and without disability is statistically significant at 10%, ** at 5%, *** at 1%
Source: Authors' calculations using CPS.

Table 3: Poverty rates across disability status and by disability type, 2010 (%)

	Official Poverty Measure	Supplemental Poverty Measure	Multidimensional Poverty - Economic Measure	Multidimensional Poverty - Socioecopolitical Measure	Multidimensional Poverty Economic Measure (w/o employment)	Multidimensional Poverty Sociopolitical Measure (w/o employment)
Disability Status						
No sensory, functional, or activity limitation	10.92	12.26	16.90	26.99	11.08	19.84
	(0.12)	(0.13)	(0.30)	(0.29)	(0.25)	(0.26)
Sensory, functional, or activity limitation	29.04	28.04	48.79	62.62	25.20	41.14
	(0.62)	(0.61)	(1.50)	(1.04)	(1.28)	(1.07)
Difference	18.11 ***	15.78 ***	31.89 ***	35.63 ***	14.13 ***	21.30 ***
Disability Type						
Hearing Limitation	20.08	19.57	29.37	43.93	17.73	31.75
	(1.24)	(1.23)	(2.87)	(2.48)	(2.33)	(2.34)
Eye Limitation	34.49	30.24	53.64	64.02	30.32	46.43
	(1.76)	(1.67)	(4.03)	(2.89)	(3.75)	(3.02)
Remembering Limitation	36.45	32.84	56.51	71.70	30.35	50.20
	(1.10)	(1.07)	(2.54)	(1.65)	(2.30)	(1.84)
Walking Limitation	31.67	30.32	56.10	67.58	28.58	43.46
	(0.83)	(0.82)	(1.98)	(1.33)	(1.80)	(1.43)
Dressing/bathing Limitation	34.74	33.79	60.06	77.04	28.47	52.29
	(1.64)	(1.61)	(3.76)	(2.48)	(3.36)	(3.02)
Going out Limitation	34.37	32.54	60.48	75.69	27.63	49.41
	(1.18)	(1.16)	(2.71)	(1.73)	(2.46)	(2.03)

Notes: Standard errors are in parentheses. All estimates are weighted. The sample includes persons aged 25 to 61.
* indicates that the difference in poverty rates between persons with and without disability is statistically significant at 10%, ** at 5%, *** at 1%
Source: Authors' calculations using CPS.

Table 4: Impact of individual elements on SPM poverty rates

	All	No Disability	Disability	Difference	
Research SPM	13.51	12.26	28.04	15.78	***
	(0.13)	(0.13)	(0.61)		
Earned Income Tax Credit	15.02	13.82	28.93	15.12	***
	(0.13)	(0.13)	(0.61)		
Supplemental Nutrition Assistance Program (SNAP)	14.66	13.19	31.58	18.39	***
	(0.13)	(0.13)	(0.63)		
Subsidized housing	14.14	12.65	31.29	18.64	***
	(0.13)	(0.13)	(0.63)		
School lunch	13.74	12.49	28.29	15.81	***
	(0.13)	(0.13)	(0.61)		
Special supplemental nutrition program for women, infants, and children (WIC)	13.55	12.29	28.07	15.78	***
	(0.13)	(0.13)	(0.61)		
Low-income home energy assistance program (LIHEAP)	13.58	12.30	28.39	16.09	***
	(0.13)	(0.13)	(0.61)		
Child support	13.32	12.07	27.83	15.76	***
	(0.13)	(0.13)	(0.61)		
Payments under Federal Insurance Contributions Act (FICA)	12.13	10.84	26.98	16.14	***
	(0.12)	(0.12)	(0.60)		
Work expenses	12.26	10.99	27.03	16.04	***
	(0.12)	(0.12)	(0.60)		
Medical out of pocket expenditures	10.83	9.91	21.52	11.62	***
	(0.12)	(0.12)	(0.56)		

Notes: Standard errors are in parentheses. All estimates are weighted. The sample includes persons aged 25 to 61.
Source: Authors' calculations using CPS.

Table 5. Deprivation rates by dimension across disability status

	Multidimensional poverty - Economic measure				
Disability Status	% no high school completion	% non-employed	% income poor	% food insecure	% without health insurance
No sensory, functional, or activity limitation	7.97	22.16	9.28	11.19	16.76
	(0.21)	(0.35)	(0.24)	(0.26)	(0.30)
Sensory, functional, or activity limitation	17.10	67.22	26.22	31.37	15.41
	(1.07)	(1.43)	(1.32)	(1.41)	(1.06)
Difference	9.13	45.05	16.94	20.17	-1.35
	***	***	***	***	NS

	Multidimensional poverty - Socioecopolitical measure				
Disability Status	% no high school completion	% non-employed	% non-voters	% with low social connectedness	% with no computer or internet access
No sensory, functional, or activity limitation	9.36	21.73	39.22	15.25	16.95
	(0.19)	(0.27)	(0.32)	(0.23)	(0.25)
Sensory, functional, or activity limitation	19.59	69.54	53.90	27.14	36.95
	(0.87)	(0.99)	(1.08)	(0.96)	(1.05)
Difference	10.23	47.81	14.68	11.89	20.00
	***	***	***	***	***

Notes: Standard errors are in parentheses. All estimates are weighted.
* indicates that the difference in poverty rates between persons with and without disability is statistically significant at 10%, ** at 5%, *** at 1%
Source: Authors' calculations using CPS.

Table 6: Mean demographic and well being characteristics as per poverty status

	Poor as per Official and SPM			Poor as per Official, not SPM			Poor as per SPM, not Official			Not poor as per SPM, nor Official		
	All	No Disability	Disability	All	No Disability	Disability	All	No Disability	Disability	All	No Disability	Disability
N	8,860	7,294	1,566	3,255	2,639	616	4,213	3,735	478	84,724	79,917	4,807
Share of people		82.33	17.67		81.08	18.92		88.65	11.35		94.33	5.67
Male	42.93	42.84	43.36	36.21	35.70	38.47	48.37	48.19	49.79	48.95	48.84	50.78
White, not Hispanic	41.51	38.77	54.28	48.94	47.40	55.52	42.44	40.19	60.04	67.04	66.94	68.71
Black	20.11	19.44	23.24	19.05	18.42	21.75	14.62	14.54	15.27	10.22	10.07	12.65
Asian	5.01	5.61	2.24	2.73	2.99	1.62	7.74	8.41	2.51	6.09	6.28	2.93
Hispanic (any race	30.58	33.67	16.16	24.82	27.13	14.94	32.35	34.27	17.36	14.37	14.55	11.44
25-44	59.13	63.78	37.48	70.81	77.95	40.26	51.29	54.06	29.71	54.38	55.71	32.22
45-61	40.87	36.22	62.52	29.19	22.05	59.74	48.71	45.94	70.29	45.62	44.29	67.78
In married couple unit	37.62	40.16	25.80	29.65	33.23	14.29	52.41	52.69	50.21	69.67	70.40	57.48
In female householder unit	40.55	39.33	46.23	45.71	43.58	54.87	23.39	28.97	32.64	16.63	16.12	25.07
In male householder unit	21.69	20.43	27.59	24.52	23.04	30.84	18.16	18.29	17.15	13.60	13.37	17.33
Native born	69.14	64.61	90.23	79.51	76.17	93.83	64.40	61.74	85.15	83.92	83.43	92.12
Foreign born	30.86	35.39	9.77	20.49	23.83	6.17	35.60	38.26	14.85	16.08	16.57	7.88
Inside MSAs	82.95	84.08	77.65	69.62	70.59	65.42	88.44	89.24	82.22	80.36	80.71	74.58
Employed in the past year	34.18	39.20	10.79	42.18	48.96	13.15	61.48	66.45	22.59	80.38	82.85	39.40
Less than high school	31.49	31.24	32.63	28.54	27.21	34.25	23.38	23.56	21.97	7.59	7.23	13.50
Has health insurance	53.21	48.55	74.90	59.32	53.20	85.55	64.25	62.54	77.62	84.60	84.52	85.94
DI	5.35	2.34	19.35	8.48	3.15	31.33	4.77	1.95	26.78	2.38	0.98	25.73
SSI	7.13	3.33	24.84	11.43	4.74	40.10	2.61	1.26	13.18	1.01	0.40	11.09
SSDI and SSI	0.78	0.25	3.26	2.27	0.72	8.93	0.43	0.21	2.09	0.19	0.07	2.27
	Poor as per Official and EMD			Poor as per Official, not EMD			Poor as per EMD, not Official			Not poor as per EMD, nor Official		
	All	No Disability	Disability	All	No Disability	Disability	All	No Disability	Disability	All	No Disability	Disability
N	2,196	1,764	432	266	256	10.00	2,367	2,003	364	17,493	16,696	797
Share of people		80.33	19.67		96.24	3.76		84.62	15.38		95.44	4.56
Male	39.98	39.91	40.28	47.74	49.22	10.00	46.98	46.68	48.63	48.50	48.32	52.20
White	69.35	69.78	67.59	66.92	67.19	60.00	75.07	75.34	73.63	80.93	81.03	78.80
Black	21.49	21.03	23.38	19.55	19.14	30.00	15.76	15.23	18.68	9.61	9.50	11.92
Asian	4.51	5.16	1.85	6.02	6.25	0.00	6.13	6.64	3.30	6.55	6.68	3.64
Hispanic (any race	28.37	32.20	12.73	18.05	17.97	20.00	34.64	38.34	14.29	10.20	10.33	7.65
25-44	59.70	65.48	36.11	71.43	70.70	90.00	57.08	61.16	34.62	52.59	53.51	33.38
45-61	40.30	34.52	63.89	28.57	29.30	10.00	42.92	38.84	65.38	47.41	46.49	66.62
In married couple unit	39.30	42.63	25.69	45.86	46.88	20.00	59.82	61.36	51.37	75.05	75.64	62.61
In female householder unit	39.80	38.04	46.99	35.71	34.38	70.00	25.39	23.86	33.79	14.22	13.84	22.08
In male householder unit	20.81	19.22	27.31	18.42	18.75	10.00	14.66	14.63	14.84	10.63	10.42	15.06
Native born	71.68	66.72	91.90	74.81	74.61	80.00	65.15	60.81	89.01	58.72	85.34	93.73
Foreign born	28.32	33.28	8.10	25.19	25.39	20.00	34.85	39.19	10.99	14.28	14.66	6.27
Inside MSAs	80.42	81.97	74.07	78.57	79.30	60.00	81.37	82.85	73.08	80.19	80.49	73.90
Employed	29.05	34.07	8.56	100.00	100.00	100.00	33.67	62.21	10.99	85.64	87.16	53.70
Less than high school	34.75	35.37	32.18	0.00	0.00	0.00	44.32	44.68	42.31	2.70	2.74	2.01
Food deprived	37.43	34.35	50.00	0.00	0.00	0.00	47.40	45.78	56.32	5.32	5.15	8.78
Has health insurance	51.82	45.07	79.40	100.00	100.00	100.00	33.92	27.96	66.76	91.87	91.72	94.98
SSDI	7.24	2.83	25.23	0.38	0.39	0.00	6.55	2.50	28.85	1.81	0.83	22.33
SSI	9.06	4.14	29.17	4.51	3.91	20.00	3.80	1.60	15.93	0.64	0.30	7.78
SSDI and SSI	0.77	0.34	2.55	0.00	0.00	0.00	0.85	0.20	4.40	0.14	0.10	1.13

Notes: All estimates are weighted. SPM stands for Supplemental Poverty Measure. EMD stands for Economic Muldi-Dimensional poverty measure.
Source: Authors' calculations using CPS.

Appendix 2: Poverty rates of persons 62 or older with and without disability by gender, education, race

		Official poverty measure				Supplemental poverty measure				Multidimensional Poverty - Measure				Economic	Multidimensional poverty measure - measure			Socioecopolitical
	Category	Without Disability	With disability	Difference	Sig	Without disability	With disability	Difference	Sig	Without Disability	With disability	Difference	Sig		Without Disability	With disability	Difference	Sig
All		7.52	13.06	5.54	***	13.47	19.83	6.36	***	6.99	12.85	5.85	***		17.89	36.91	19.01	***
		(0.21)	(0.42)			(0.28)	(0.51)			(0.48)	(0.95)				(0.40)	(0.79)	0.3931	
Gender																		
	Male	6.20	9.47	3.27	***	11.90	15.97	4.07	***	6.51	10.92	4.41	***		15.94	33.15	17.21	***
		(0.28)	(0.57)			(0.39)	(0.73)			(0.75)	(1.47)				(0.57)	(1.18)		
	Female	8.61	15.71	7.10	***	14.75	22.67	7.92	***	7.31	14.02	6.71	***		19.49	39.69	20.20	***
		(0.30)	(0.60)			(0.39)	(0.70)			(0.62)	(1.24)				(0.55)	(1.06)		
Education																		
	< H.S.	17.23	22.79	5.56	***	25.64	29.00	3.37	NS	34.86	39.55	4.69	NS		59.60	67.04	7.44	***
		(0.77)	(1.00)			(0.89)	(1.10)			(2.22)	(2.67)				(1.37)	(1.48)		
	H.S.	7.91	11.62	3.70	***	14.28	18.63	4.35	***	2.58	3.64	1.06	NS		17.06	30.34	13.28	***
		(0.37)	(0.67)			(0.48)	(0.84)			(0.49)	(0.85)				(0.65)	(1.22)		
	> H.S.	4.58	7.55	2.97	***	9.56	14.48	4.92	***	1.29	2.43	1.14	NS		6.49	19.43	12.95	***
		(0.24)	(0.56)			(0.34)	(0.75)			(0.31)	(0.70)				(0.36)	(1.09)		
Race																		
	White	6.39	11.36	4.97	***	12.07	18.32	6.25	***	5.42	10.13	4.72	***		16.97	35.68	18.71	***
		(0.22)	(0.45)			(0.29)	(0.55)			(0.48)	(0.96)				(0.42)	(0.85)		
	White, not Hispanic	5.64	10.15	4.51	***	10.98	17.23	6.25	***	3.68	7.89	4.22	***		15.27	34.07	18.79	***
		(0.22)	(0.46)			(0.30)	(0.58)			(0.44)	(0.89)				(0.40)	(0.86)		
	Black	15.76	25.31	9.56	***	23.38	28.25	4.87	***	13.41	26.27	12.86	***		24.19	44.90	20.71	***
		(0.85)	(1.49)			(0.98)	(1.54)			(1.64)	(3.06)				(1.60)	(2.71)		
	Asian	12.35	17.26	4.91	*	21.22	33.39	12.17	***	10.42	10.78	0.36	NS		24.55	40.48	15.93	***
		(1.23)	(2.64)			(1.50)	(3.26)			(2.40)	(5.53)				(2.44)	(5.12)		
	Hispanic (any race	15.15	25.44	10.29	***	24.61	30.91	6.29	***	20.58	31.36	10.78	*		35.43	54.05	18.63	***
		(0.89)	(1.78)			(1.07)	(1.86)			(2.42)	(5.00)				(2.04)	(3.46)		

Notes: * indicates that the difference in poverty rates between persons with and without disability is statistically significant at 10%, ** at 5%, *** at 1%

All estimates are weighted using the ….. Weight

The disability measure is based on the six functional and basic activity limitation questions in the CPS, as described in the paper.

Note: This is table 2 replicated for the elderly (people aged 62 and above) using only the six question disability measure.

For the elderly, the multi measure of course does not include employment as a dimension

Appendix 3. Multidimensional poverty analysis for persons with and without disability

	Headcount as percentage H					Average # of deprivations among poor A					H*A (adjusted headcount)				
	All	PWDs	PWoDs	Difference		All	PWDs	PWoDs	Difference		All	PWDs	PWoDs	Difference	
Multidimensional Poverty - Economic Measure															
Threshold k															
1	44.04	80.47	41.52	38.95	***	1.66	1.96	1.62	0.34	***	73.19	157.60	67.36	90.24	***
	(0.40)	(1.22)	(0.41)			(0.01)	(0.03)	(0.01)			(0.01)	(0.03)	(0.01)		
2	18.96	48.79	16.90	31.89	***	2.54	2.58	2.53	0.05		48.13	125.92	42.75	83.17	***
	(0.30)	(1.50)	(0.30)			(0.01)	(0.03)	(0.01)			(0.01)	(0.04)	(0.01)		
3	7.77	22.07	6.79	15.28	***	3.31	3.28	3.32	-0.03		25.75	72.48	22.52	49.96	***
	(0.20)	(1.22)	(0.20)			(0.01)	(0.03)	(0.02)			(0.01)	(0.04)	(0.01)		
4	2.13	5.93	1.87	4.06	***	4.14	4.06	4.16	-0.10	***	8.82	24.06	7.77	16.29	***
	(0.11)	(0.68)	(0.10)			(0.02)	(0.03)	(0.02)			(0.00)	(0.03)	(0.00)		
5	0.30	0.35	0.29	0.06		5.00	5.00	5.00	0.00	***	1.48	1.74	1.46	0.29	
	(0.04)	(0.16)	(0.04)			(0.00)	(0.00)	(0.00)			(0.00)	(0.01)	(0.00)		
Multidimensional Poverty - Socioecopolitical Measure															
Threshold k															
1	64.69	89.37	62.55	26.81	***	1.71	2.32	1.64	0.68	***	110.83	207.11	102.51	104.61	***
	(0.29)	(0.65)	(0.31)			(0.01)	(0.03)	(0.01)			(0.01)	(0.03)	(0.01)		
2	29.83	62.62	26.99	35.63	***	2.55	2.88	2.48	0.40	***	75.97	180.37	66.94	113.42	***
	(0.29)	(1.04)	(0.29)			(0.01)	(0.03)	(0.01)			(0.01)	(0.03)	(0.01)		
3	12.00	36.01	9.93	26.08	***	3.36	3.53	3.31	0.23	***	40.32	127.14	32.81	94.33	***
	(0.20)	(1.04)	(0.20)			(0.01)	(0.02)	(0.01)			(0.01)	(0.04)	(0.01)		
4	3.70	15.94	2.64	13.30	***	4.17	4.20	4.15	0.05	*	15.40	66.93	10.95	55.98	***
	(0.12)	(0.80)	(0.10)			(0.01)	(0.02)	(0.01)			(0.00)	(0.03)	(0.00)		
5	0.62	3.17	0.40	2.78	***	5.00	5.00	5.00	0.00	***	3.08	15.87	1.98	13.90	***
	(0.05)	(0.39)	(0.04)			(0.00)	(0.00)	(0.00)			(0.00)	(0.02)	(0.00)		

Appendix A: Sample description

		Persons without disability		Persons with disability		Difference	Sig
	Category	Number	wt%	Number	wt%		
	All people	93,585	100%	7,467	100%		
			(0.00)		(0.00)		
Gender							
	Male	44,900	48.73%	3,595	48.76%	0.03%	
			(0.19)		(0.68)		
	Female	48,685	51.27%	3,872	51.24%	-0.03%	
			(0.19)		(0.68)		
Age							
	25-44	53,249	54.79%	2,526	31.40%	-23.39%	***
			(0.19)		(0.62)		
	45-61	40,336	45.21%	4,941	68.60%	23.39%	***
			(0.19)		(0.62)		
Race							
	White	74,109	80.32%	5,669	78.99%	-1.33%	**
			(0.15)		(0.52)		
	White, not Hispanic	59,077	66.29%	4,782	69.73%	3.44%	***
			(0.18)		(0.59)		
	Black	10,496	11.85%	1,179	15.20%	3.35%	***
			(0.12)		(0.46)		
	Asian	5,818	5.52%	198	2.03%	-3.49%	***
			(0.08)		(0.17)		
	Hispanic (any race	16,076	15.06%	978	10.30%	-4.76%	***
			(0.12)		(0.36)		
Type of Unit							
	In married couple unit	62,036	63.46%	3,495	45.41%	-18.05%	***
			(0.19)		(0.67)		
	In female householder unit	17,987	20.08%	2,423	32.47%	12.40%	***
			(0.16)		(0.64)		
	In male householder unit	13,467	16.38%	1,537	21.96%	5.58%	***
			(0.15)		(0.57)		
Nativity							
	Native born	75,700	81.92%	6,826	92.39%	10.47%	***
			(0.14)		(0.34)		
	Foreign born	17,885	18.08%	641	7.61%	-10.47%	***
			(0.14)		(0.34)		
Residence							
	Inside MSAs	75,826	85.19%	5,597	78.86%	-6.33%	***
			(0.13)		(0.54)		
	Outside MSAs	17,006	14.09%	1,814	20.43%	6.34%	***
			(0.13)		(0.53)		
Region							
	Northeast	18,271	18.14%	1,408	16.59%	-1.54%	***
			(0.15)		(0.51)		
	Midwest	20,788	21.59%	1,729	24.02%	2.43%	***
			(0.16)		(0.58)		
	South	29,712	36.75%	2,521	38.56%	1.81%	***
			(0.19)		(0.76)		
	West	24,814	23.52%	1,809	20.82%	-2.70%	***
			(0.16)		(0.53)		

Notes: Standard errors are in parentheses. All estimates are weighted. The sample includes persons aged 25 to 61.
The disability measure is based on the six functional and basic activity limitation questions in the CPS, as described in the paper.
Asterisks indicate significant difference in sample composition between persons with and without disability.
* is statistically significant at 10%, ** at 5%, *** at 1%. N.S. stands for not significant
Source: Authors' calculations using CPS.

Appendix B: Poverty rates across disability status for different disability measures, 2010 (%)

Disability Status	Official Poverty Measure	Supplemental Poverty Measure	Multidimensional Poverty - Economic Measure	Multidimensional Poverty - SocioecopoliticalMeasure	Multidimensional Poverty Economic Measure (without employment dim)
Sensory, functional, or basic activity limitations					
No sensory, functional,	10.92	12.26	16.90	26.99	11.08
	(0.12)	(0.13)	(0.30)	(0.29)	(0.25)
Sensory, functional, or a	29.04	28.04	48.79	62.62	25.20
	(0.62)	(0.61)	(1.50)	(1.04)	(1.28)
Difference	18.11 ***	15.78 ***	31.89 ***	35.63 ***	14.13 ***
Work Limitation					
No work limitation	10.46	11.85	16.28		10.76
	(0.12)	(0.12)	(0.30)		(0.24)
Work Limitation	33.34	31.96	56.71		29.22
	(0.63)	(0.62)	(1.45)		(1.35)
Difference	22.87 ***	20.12 ***	40.43 ***		18.46 ***
				N/A	
Any Disability					
No Disability	10.04	11.45	15.72		10.50
	(0.12)	(0.12)	(0.30)		(0.25)
Disability	29.97	29.15	49.34		25.90
	(0.51)	(0.51)	(1.23)		(1.08)
Difference	19.93 ***	17.70 ***	33.62 ***		15.39 ***

Notes: Standard errors are in parentheses. All estimates are weighted. The sample includes persons aged 25 to 61.
* indicates that the difference in poverty rates between persons with and without disability is statistically significant at 10%, ** at 5%, *** at 1%
Source: Authors' calculations using CPS.

Appendix C. Deprivation rates by dimension for other disability measures

	Economic measure				
Disability Status	% No High School Completion	% Non-Employed	% Income poor	% Food deprived	% Without health insurance
Work Limitation					
No work limitation	7.69	20.91	8.68	11.29	16.78
	(0.20)	(0.34)	(0.23)	(0.26)	(0.30)
Work Limitation	20.76	83.76	34.42	29.47	15.11
	(1.17)	(1.10)	(1.41)	(1.37)	(1.04)
Difference	13.06	62.85	25.74	18.18	-1.68
	***	***	***	***	Not significant
Any Disability					
No Disability	7.56	20.23	8.45	10.81	16.72
	(0.20)	(0.34)	(0.23)	(0.26)	(0.30)
Disability	17.98	70.48	28.54	28.29	16.23
	(0.91)	(1.14)	(1.12)	(1.13)	(0.89)
Difference	10.42	50.24	20.08	17.47	-0.49
	***	***	***	***	Not significant

Notes: Standard errors are in parentheses. All estimates are weighted. The sample includes persons aged 25 to 61.
* indicates that the difference in poverty rates between persons with and without disability is statistically significant at 10%, ** at 5%, *** at 1%
Source: Authors' calculations using CPS.

[i] For extensive analyses of these pathways, see for instance Palmer (2011), as well as Fremstad (2009) on income poverty and Mitra et al. (2012) on poverty understood multi-dimensionally.

[ii] Income includes earnings, unemployment benefits, worker's compensation, social security, supplemental security income, public assistance, veteran's payments, survivor benefits, pension or retirement income, interest, dividends, rents, royalties, income from estates, trusts, educational assistance, alimony, child support, assistance from outside the household, and other miscellaneous sources of income.

[iii] We also assessed the sensitivity of the results to varying the cutoff number of dimensions. Results available from authors.

[iv] We use the summary food security status measure developed and used by the U.S. Department of Agriculture to track food security in the U.S. (Coleman-Jensen et al., 2011). It is calculated based on a series of questions in the CPS and categorizes households into four food security statuses: high/marginal/low/very low. We consider a person to be deprived if he/she is part of a household that had low to very low food security status for the past 12 months.

[v] The social connectedness measure is calculated from the CPS Civic Engagement Supplement questions related to an individual's social network and is based on work by the Corporation for National and Community Service (CNCS) (2011). Respondents were asked about the following activities: eating dinner with other household members; talking with neighbors; exchanging favors with neighbors; and communicating with friends and family via the internet. We ignore the first activity regarding eating dinner with others given that it only applies to people who do not live alone. For each of the three remaining questions, we have an answer scale of one to five: 1) Not at all. 2) Once a Month. 3) A few times a month. 4) A few times a week. 5) Basically every day. We calculate a social connectedness index by summing up answers to the three questions. For the unweighted sample (n=33,952), the mean score was 8.599 with a standard deviation of 2.889. We consider persons to be deprived in terms of social connectedness if their social connectedness index is five or below. This cutoff captures people with limited or no connection to others.

[vi] As the characteristics of individuals were similar in the three samples, detail is only provided for the first sample in Table 1-A, in the Appendix.

[vii] We also assessed the sensitivity of our multidimensional poverty measures as the cutoff number of dimensions varies and calculated the average number of wellbeing deprivations that the poor experience. Results are available from authors.

[viii] Results in Table 4 differ from those reported in Short (2011) by about 2-3 percentage points per category. This might be explained by Short's inclusion of children and elderly people, whereas for the purposes of this paper only the working aged population was considered.