

Using Linked Survey and Administrative Data to Better Measure Income: Implications for Poverty, Program Effectiveness, and Holes in the Safety Net[†]

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We examine the consequences of survey underreporting of transfer programs for prototypical analyses of low-income populations. We link administrative data for four transfer programs to the CPS to correct its severe understatement of transfer dollars received. Using survey data sharply understates the income of poor households, distorts our understanding of program targeting, and greatly understates the effects of anti-poverty programs. Using the combined data, the poverty-reducing effect of all programs together is nearly doubled. The effect of housing assistance is tripled. Correcting survey error often reduces the share of single mothers falling through the safety net by one-half or more. (JEL C83, I32, I38)

Survey data are used for many purposes and are one of the most important sources of information for policymakers and researchers. A large share of the empirical research in economics and other social sciences relies on survey data, as indicated by the hundreds of thousands of citations to the Current Population Survey (CPS). Additionally, many of the official statistics that are frequently used to design and evaluate policies, such as the rates of unemployment and health insurance coverage, rely on household survey data. The CPS is the source of these statistics, as well as official income distribution and poverty statistics. The survey is also extensively used to determine the effects of transfers on the income distribution, program participation rates, and the extent to which individuals are missed by specific programs

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or by the safety net entirely. However, the usefulness of the information in the CPS and other household surveys depends on its accuracy, which has unfortunately been declining, because survey errors have grown over time (Meyer, Mok, and Sullivan 2015a, b). Survey errors are an issue for many variables,¹ but are particularly severe for transfer programs. In the CPS, receipt is missed for over one-third of housing assistance recipients, over 40 percent of Supplemental Nutrition Assistance Program (SNAP) recipients, and over 60 percent of Temporary Assistance for Needy Families (TANF) and General Assistance recipients, based on the New York data we describe below. Even among those who correctly report receipt, average amounts received in the CPS fall short of the accurate amounts by 6 percent for SNAP, 40 percent for TANF and General Assistance, and 74 percent for housing assistance. While past research has found substantial errors in survey data, it has not shown that the errors fundamentally change standard analyses.

In this paper, we examine the implications of CPS survey errors, showing that they can lead to large errors in the analyses of three literatures that rely on program receipt and income data. A fundamental difficulty in evaluating the extent of survey errors and their consequences is that one needs an external measure of truth to compare to survey responses. In this study, we replace survey responses on the receipt and amount of government transfers with administrative records for four income transfer programs (food stamps, TANF, General Assistance, and subsidized housing) over a four-year period. In most cases, the administrative records are extremely accurate (they contain actual payments made, they are validated by the agency, and definitions are comparable to survey definitions). The administrative data are linked to survey data at the household level with a high match rate because validated Social Security numbers are required to receive three of the programs. We focus on descriptive analyses in this paper because the consequences of misreporting are clear for these statistics. The direction and rough magnitude of biases we see are likely to apply in many other similar analyses. However, any lessons from studies of multivariate regression models are likely to be much less general, depending on the control variables and other elements of the specification (Meyer and Mittag 2017; Meyer, Mittag, and Goerge 2018).

The first of the three literatures we reexamine studies the distribution of income among those with few resources. Most well known is the annual official income and poverty report, the 2017 version being Semega, Fontenote, and Kollar (2017). The official poverty rate is also one of the most cited government statistics in the popular press. Many other scholars have used the CPS to calculate poverty or income-distribution measures at the bottom, including Blank and Schoeni (2003); Hoynes, Page, and Stevens (2006); and Armour, Burkhauser, and Larrimore (2013). A second prototypical question researchers and policymakers ask is how the addition of the income from specific programs alters the poverty rate and other measures of material deprivation. Estimates of the poverty-reducing effects of policies and

¹ For example, significant measurement error has been documented for income (e.g., Bound and Krueger 1991; Bollinger 1998; Dahl, DeLeire, and Schwabish 2011; and Abowd and Stinson 2013), education (Black, Sanders, and Taylor 2003), employment status (Poterba and Summers 1986, Chua and Fuller 1987), and health insurance coverage (Davern et al. 2008). Bound, Brown, and Mathiowetz (2001) provides an overview.

which types of individuals benefit are based on such calculations. Such analyses for more than a dozen government programs can be seen in the annual Supplemental Poverty Measure report, the 2017 version being Fox (2018). Many researchers have conducted similar analyses, such as the series of papers using the Survey of Income and Program Participation (SIPP) exemplified by Ben-Shalom, Moffitt, and Scholz (2012). A third important question is who is missed by transfer programs. This information may point to failings of the safety net to reach many of those who it is intended to help. Maybe most well known in this line of work are the papers by Blank and Kovak (2009) and related papers by Bitler and Hoynes (2010), Loprest (2011), and Loprest and Nichols (2011) on single mothers, who neither work nor receive government transfers.

Several papers have examined errors in CPS income data, but have focused on only the first of the literatures we reexamine. Almost all have focused on the types of errors or components of income that lead to small biases. Survey errors are often divided into three types: unit nonresponse (failure to respond to a survey at all), item nonresponse (not answering certain questions), and measurement error (giving inaccurate answers). Korinek, Mistiaen, and Ravallion (2007) finds a small downward bias in the poverty rate due to unit nonresponse, but Bee, Gathright, and Meyer (2015) finds little bias in income measures. Several studies examine whether earnings imputation to address item nonresponse affects measures of poverty (Turek et al. 2009; Hokayem, Bollinger, and Ziliak 2015) and estimates of the income distribution (Bollinger et al. forthcoming). These papers find a modest understatement of poverty and inequality due to earnings nonresponse.² Studies of measurement error have found that earnings tend to be reported relatively well in surveys (Roemer 2000), and whether survey or administrative reports are closer to the truth is less clear for earnings than it is for some other income sources (Bollinger 1998, Abowd and Stinson 2013). There is mounting evidence that when measuring mean program dollars received by a household, measurement error is by far the largest source of bias in survey values (Meyer, Mok, and Sullivan 2015a; Meyer and Mittag 2019b), but less is known about its consequences. A few papers have focused on measurement error in transfer or pension reporting for the poverty of the elderly using linked survey and administrative microdata. Nicholas and Wiseman (2010) finds small biases in poverty rates, while Bee and Mitchell (2017), who use a broader set of administrative data sources, finds quite large overstatement of poverty for the elderly.

In our analyses of the three literatures, we find that survey errors, mainly the misreporting of government transfer receipt and amounts and to a lesser extent item nonresponse and inaccurate imputation, greatly distort our view of the situation of those with the fewest resources and the effects of transfer programs. Using the administrative variables, poverty and inequality are lower than officially reported, program effects are larger, and fewer individuals have fallen through the safety net. Incomes below the poverty line are substantially understated in the CPS, particularly

² While the role of imputation in biasing the poverty rate may be small, other work (Bollinger and Hirsch 2006) has shown that item nonresponse and imputation can severely bias analyses of regression coefficients, such as the union earnings differential.

below half the poverty line, where unreported transfers exceed reported cash income. While the substantive importance of underreporting becomes smaller as reported income rises, correcting for underreporting makes a larger difference to household resources than including reported noncash benefits throughout the income distribution. Correcting for underreporting of transfer receipt also reveals that government anti-poverty policies are much more effective: in the corrected data, the poverty-reducing effect of all programs combined is nearly doubled while the effect of housing assistance is tripled. Both the change in household income and the revised poverty reduction are even more pronounced for some subpopulations that are at particular risk of deprivation. The correction is particularly large for single mothers: using administrative instead of reported program receipt shows that the four programs reduce the poverty rate by an additional 11 percentage points, amplifying the poverty-reducing effect of public assistance more than six-fold and that of housing assistance more than ten-fold. In addition, we find that the fraction of nonworking single mothers missed by government transfers is much lower than previously reported. Depending on how we define being missed by the safety net, the CPS overstates the fraction by 33–113 percent. This result underlines that the coverage of the safety net is much better than the survey data suggest. Trends in poverty rates are also appreciably different when incorporating the administrative data in the survey. More generally, the study demonstrates how administrative data can be linked to survey data to improve income measures, a method likely to become commonplace, maybe even institutionalized in the future.

In Section II, we describe our linked survey and administrative data and report on the extent of misreporting. In the following sections, we use our linked administrative data to reexamine prototypical analyses of low-income populations. We perform each analysis twice, once using the survey answers and once using the administrative measures of program receipt and amounts received. In Section III, we examine the distribution of government transfers across the income distribution. In Section IV, we examine the poverty-reducing effects of the different transfer programs. In Section V, we examine the frequency with which families are missed by the programs. Section VI discusses the applicability of our results to the entire United States, to other programs, and to other surveys. Section VII offers conclusions, outlining the implications of our results for researchers and policymakers.

I. Data, Methods, and the Extent of Measurement Error

A. Data

We begin with household survey data from the New York State sample of the 2008–2013 Current Population Survey Annual Social and Economic Supplement (CPS-ASEC). Early in the survey year, usually March, the CPS asks about income in the previous calendar year (the reference year). Income is collected on many sources including earnings and a large set of government transfer programs. Imputed values for many in-kind benefits are also available in the survey files.

We link administrative records from two sources to the CPS. The first set of administrative records is from the New York State Office of Temporary and

Disability Assistance (OTDA). The records are monthly payments from SNAP (food stamps), TANF, and General Assistance for all individuals in New York State from 2007 through 2012. Since the 1996 Welfare Reform Act, General Assistance has grown relative to federal cash assistance; in recent years, total benefit payments have exceeded those of TANF both nationally and in New York.³ Besides payment amounts and dates, the files include addresses and payment types. The records are from actual payments and appear to be accurate. For SNAP, for example, the overall total from our administrative records differs from official aggregate outlays by less than 1 percent in all years. The individual identifiers have been checked by NY OTDA against Social Security records.

The second source of administrative data is records on housing assistance from the Department of Housing and Urban Development (HUD). These records are from the 2009–2012 PIC and TRACS data files and include the programs under HUD jurisdiction. The records contain information on all program recipients including addresses, number and ages of family members, and rent paid by the tenant from April 2008 to March 2012. While the data include the market rent for most units, because they are part of voucher programs, the data do not include rent amounts for publicly owned housing units. We impute market rent for these units using conditional mean imputation within cells formed by the five-digit zip code and household size. Further details on the data and imputations as well as the definitions discussed in the remainder of this section are provided in the Data Appendix.

B. *Methods*

We match the administrative data to the CPS survey data at the individual level using individual identifiers created by the Person Identification Validation System (PVS) of the US Census Bureau.⁴ In short, the PVS uses the person data (such as address, name, gender, and date of birth) from the administrative records and survey data to search for a matching record in a reference file derived from the Social Security Administration Numerical Identification file. The reference file contains all transactions recorded against a Social Security number. If a matching record is found, the Social Security number of the record from the reference file is transformed into a protected identification key (PIK) and attached to the corresponding records in our data. A PIK is obtained for over 98 percent of the administrative records from each source. Our unit of analysis is a household, so we aggregate the data to the household level. Using the household as the unit of analysis is logical given the sharing of resources among members, but it also insures a high rate of data linkage. Since the administrative data contain records for each recipient person, we are able to link the information from a program case to the household if we can link any recipient in the household. Ninety-one percent of the households in the CPS contain at least one member with a PIK. To account

³The national numbers are based on the Bureau of Economic Analysis National Income and Product Accounts, table 3.12, line 37 (available at https://apps.bea.gov/iTable/iTable.cfm?reqid=19&step=3&isuri=1&nipa_table_list=110&categories=survey), which come from a survey of states and localities on their expenditures.

⁴Mulrow et al. (2011) and Wagner and Layne (2014) discuss the PVS in detail.

for incomplete matching, we multiply the household weights by the inverse of the predicted probability of any household member having a PIK (see, e.g., Wooldridge 2007).⁵ This inverse probability weighting restores representativeness of the linked sample under the assumption that PIKs are missing at random conditional on the covariates used to predict the probability of a household having a PIK. As the high rate of PIK linking suggests, our results do not appreciably change when using the adjusted household weights.

Our main approach is to consider two measures of household income or program receipt: first, a measure that relies only on survey data and, second, a measure that substitutes some or all of our administrative data for the survey data on transfer-program receipt. The CPS questions regarding SNAP, TANF, and General Assistance refer to receipt during the previous calendar year, and we define the administrative variables accordingly. In our analyses below, we aggregate TANF and General Assistance to public assistance because the two programs have the same benefits in New York and cases are allocated to the programs in significant part to satisfy federal rules rather than based on other distinctions.

The housing data neither include state and city funded programs nor those funded by non-HUD federal agencies, so they do not cover all types of public housing. Thus, individuals who report housing assistance in the survey data, but cannot be found in the HUD data, may very likely be receiving benefits through a non-HUD housing program. Therefore, we consider a household to be a recipient of housing assistance if it is a recipient according to either the survey or the administrative data. In contrast to the other transfer programs, the CPS questions on housing assistance refer to the current month rather than the previous year. Thus, we define receipt of housing assistance in the linked data based on the current month as well. The amount of the housing subsidy in the CPS is not reported, but imputed by the US Census Bureau using an adjusted conditional mean imputation based on the American Housing Survey (AHS). The imputation of the subsidy amount is based on sparse information, so that the CPS contains at most nine unique values of the subsidy for each of the four regions, and the same value is assigned to a family of similar composition and income in New York City and Slippery Rock, Pennsylvania.⁶ In light of these shortcomings of the amounts on the official CPS file, we also report results using the imputed housing-subsidy amounts that the US Census Bureau creates for the experimental poverty measure (Dalaker 2005). We refer to these amounts as “experimental housing-subsidy amounts” below and summarize key differences from the

⁵ The Data Appendix provides further detail on the adjustment and how we obtain the required probabilities. The adjustment does not correct for failure to link households in which all members with a PIK are true non-recipients, but there are true recipients among the members without a PIK. In the online Appendix, we explain that such cases should be uncommon and note a result in related work (Meyer, Mittag, and Goerge 2018) that such errors cause the incompletely linked data to understate the difference between survey reports and true receipt.

⁶ The imputation uses predicted amounts derived from a model estimated in the 1985 AHS (adjusted for inflation). Most of the predictor and cell variables in the model are imputed themselves (e.g., market rent in the AHS and unit size in the CPS are imputed). The cells for the imputation of the subsidy are based on very sparse criteria (three income ranges, three apartment sizes, and four geographic regions).

measure on the official file. Full results are provided in the online Appendix and supplementary tables.⁷

We use these imputed CPS market values for those who report receipt of housing assistance in the survey, but do not receive assistance from any of the programs in the administrative HUD data, while we use the administrative amount whenever the administrative data indicate receipt.⁸ The validation information for housing is only available from 2008 to 2011. Consequently, we limit most analyses to this time period. The safety net in New York is more extensive than in other states, with receipt rates and amounts received above the national average, particularly for housing assistance. Consequently, we report several results without housing assistance to focus on the more nationally comparable parts of the safety net.⁹

Due to the high match rates and the quality of the administrative data, we believe that the administrative information on program receipt is accurate enough for us to consider as the truth. We do not mean to claim that linked administrative data are free of errors or contain fewer errors than survey data in general. Both administrative data and data linkage vary substantially in quality. Our records are based on actual payments, which are monitored well and consequently line up very closely with administrative aggregates. Other linked data, such as some components of tax records, are based on individual reports, so they may be as error ridden as some survey variables. In such cases, it may be better to combine administrative and survey measures as in Kapteyn and Ypma (2007); Meijer, Rohwedder, and Wansbeek (2012); Abowd and Stinson (2013); or Oberski et al. (2017). While our administrative variables are not error free, such errors should be infrequent compared to the extent of survey misreporting. Therefore, we argue that the results based on the linked administrative data are close to true values.

C. Measurement Error

We first summarize the extent of error in survey data on program receipt and amounts to document the need for corrected income-distribution estimates. The first three columns of Table 1 report error rates for the full New York sample, while the last three columns show similar rates for those with income below twice the poverty line, given our focus on those with low incomes. The errors arise from a combination of misreporting and imputation due to item nonresponse, or for housing assistance amounts, the absence of a survey question. The first row of Table 1 reports the false-negative rates, i.e., the share of true recipients who do not report receipt in the survey. In the full sample, the false-negative rate is 43, 63, and 36 percent for SNAP, public assistance, and housing assistance, respectively.

⁷The experimental housing-subsidy amounts use fair market rents instead of imputations from the AHS and uses an imputed tenant payment. See Johnson, Renwick, and Short (2011); and Renwick and Mitchell (2015) for further discussion and several alternatives. Results using the housing imputation for the supplemental poverty measure (Short 2015) for the years when it is available (after 2009) are qualitatively similar and available upon request.

⁸In both cases, we annualize the current month subsidy as described in the online Appendix.

⁹Another reason to do so is that public assistance and SNAP benefits can be viewed as cash or close to cash, while housing benefits may be valued at less than cost given their in-kind nature or if landlords inflate rents, as Collinson and Ganong (2018) argue. Others argue that the greater certainty of public benefits may make them more valuable than cash in the form of variable earnings (Blundell et al. 2013, Deshpande 2016).

TABLE 1—SURVEY ERRORS IN TRANSFER-RECEIPT REPORTING, CPS NEW YORK, 2008–2011

Error type	Sample	Full sample			Income < 2× poverty line		
		SNAP	Public assistance	Housing assistance	SNAP	Public assistance	Housing assistance
False negatives	True recipients	42.8%	63.3%	35.6%	33.0%	56.8%	29.6%
False positives	True non-recipients	1.9%	0.7%	2.8%	7.6%	2.0%	8.0%
Absolute error in amount > \$500	Recipients who report	53.22%	87.89%	97.50%	52.66%	88.27%	97.57%
Mean of true amount (annual)	Recipients who report	\$3,389	\$5,213	\$12,000	\$3,499	\$5,317	\$12,014
Mean of reported amount (annual)	Recipients who report	\$3,170	\$3,152	\$3,081	\$3,262	\$3,004	\$3,230
SD of error in amount	Recipients who report	\$2,392	\$4,619	\$8,776	\$2,341	\$4,384	\$8,657
Correlation true and reported amount	Recipients who report	0.55	0.22	0.07	0.57	0.26	0.08

Notes: The estimation uses households with at least one PIKed member only; weights are adjusted for PIK rates. SNAP and public assistance amounts are the average annual receipt per household; housing assistance amounts are annualized from monthly amounts per household. False positives for housing assistance may be recipients of non-HUD housing programs and therefore should not necessarily be interpreted as survey errors.

The error rates are still high, but somewhat lower in the subsample of those with incomes below twice the poverty line. The full-sample false-negative rates for SNAP and public assistance are higher than found 30 years ago by Marquis and Moore (1990) in the SIPP, but lower for SNAP than found recently in Meyer, Mittag, and Goerge (2018) in the CPS for Illinois and Maryland.

Reported in the second row of the table, the false-positive rate, i.e., the share of true non-recipients who are recorded as recipients, is much lower for these programs. The rates are 1.9, 0.7, and 2.8 percent for SNAP, public assistance, and housing assistance, respectively. While the rates of false positives are low, they apply to the much larger pool of non-recipients, so they constitute a substantial share of households. As a consequence, the reporting rate, the share of dollars paid out that are reported in the survey, is substantially higher than the share among true recipients. The false-positive rates are high in this table for two additional reasons. First, a substantial share of households does not answer the receipt questions and has imputed responses. A large share of the false positives is due to the educated guesses by the US Census Bureau. This is particularly severe for SNAP and public assistance, where imputed responses make up 36 and 43 percent of the false positives. Second, as discussed above, in the case of housing assistance, we cannot be certain that households who report receipt, but are not recorded in the HUD data, do not receive housing assistance from non-HUD federal, state, or local programs. Given that there are several such programs in New York, it is likely that the majority of the 2.8 percent false-positive rate for housing assistance is due to recipients of other programs.¹⁰

¹⁰ Thus, in the analyses below, we treat the reports of housing assistance that are not recorded in the HUD administrative data as correct reports, but we do not treat such cases as correct here in order to illustrate the difference between the administrative and the survey data.

There is even less previous evidence of misreporting of amounts than of misreporting of receipt. However, our results show that it is a substantial problem as well. The third row of Table 1 shows that more than half of those who correctly report receipt of SNAP commit large errors (more than \$500 in absolute value) in reporting annual amounts. This misreporting of amounts is even worse for public assistance, where only 12 percent of reporting recipients report an amount that lies within \$500 of their true amount. Our results show that the differences between the imputed housing assistance amounts and the accurate values are large, understating the true average subsidy by a factor of almost four. At the individual level, 97.5 percent of the imputed amounts for reporting recipients are off by \$500 or more, and 75 percent are off by \$4,000 or more in the annual amount. This discrepancy is not surprising given the shortcomings of the imputation procedure discussed above. It is also in line with the differences Johnson, Renwick, and Short (2011) finds when comparing aggregate numbers from HUD and the CPS for the entire United States.¹¹

The discrepancies in amounts recorded for true recipients are not as extreme for SNAP and public assistance. However, the correlations between accurate and reported amounts are low, and the standard deviations of the errors are on the order of 75 percent of mean amounts received. This pattern further underlines that even among those who correctly report receipt, few report correct amounts. On the positive side, the results show that amounts are understated less on average than receipt. The results confirm the finding in Meyer, Mok, and Sullivan (2015a) that there is only slight net underreporting of amounts by true SNAP recipients, but our results show substantial underreporting of amounts of public assistance and housing assistance. We suspect that the substantial underreporting of public assistance amounts is at least partly due to a large share of recipients having a portion of their payment sent directly to their landlord. Taken together, the findings of substantial errors in both receipt and amounts received suggest that misreporting has the potential to sharply alter the outcomes we examine.

While microdata-based false-negative rates are not available for the rest of the country, one can compare the net reporting rate, the share of program dollars paid out that is recorded in the survey, in New York to that of the rest of the United States. The sources of state-level reporting rates as well as national rates by year can be found in Meyer, Mok, and Sullivan (2015a, b). These rates suggest that New York has worse reporting of public assistance than the rest of the United States, but better reporting of SNAP than other states. In Section VI, we discuss the differences between New York and the rest of the United States and the broader applicability of our results.

D. Income Measures and Subpopulations

In the analyses below, we use reported pretax money income (in 2012 dollars) as our main measure of income, since it is the official and most commonly used

¹¹ The differences they find are smaller, but the actual subsidies are higher in New York than in the United States (yet imputations are not), and we calculate amounts per household rather than family. Due to lack of data access, we cannot compute household-level error rates for the experimental housing-subsidy amounts; see Johnson, Renwick, and Short (2011) and Renwick and Mitchell (2015) for comparisons.

measure of household resources in the CPS. However, we repeat all analyses using a supplemental poverty measure (SPM) type income definition, which includes in-kind transfers (reported food stamps and imputed market values of housing assistance, school lunch, Medicaid, Medicare, and employer health insurance contributions), and subtracts taxes (state and federal income and payroll taxes after credits). Our measures of poverty use the official federal poverty thresholds, which we do not adjust for the SPM income measure. We also use the poverty thresholds as an equivalence scale to adjust for household size and composition by reporting results in terms of income relative to the poverty line. The federal poverty thresholds arguably have several shortcomings and are often considered arbitrary, but in lieu of a universally preferred measure, they provide a well-known and easily interpretable metric to analyze economic hardship. Contrary to unlinked administrative records, our linked data provide us with the demographic detail necessary to analyze demographic groups that are known to be particularly affected by poverty. Therefore, besides analyzing the overall population, we focus on three disadvantaged groups: single mother-headed households (unmarried females with at least one child under 18 present), households with an elderly member (age 65 or older), and households with a disabled member.¹²

II. Program Effects across the Income Distribution

We first examine how misreporting affects our understanding of the economic well-being of households throughout the income distribution, particularly low-income households. Underreporting of government transfers severely understates incomes in deep poverty and thereby makes poverty look more severe and inequality look worse than it truly is. In addition, while missing dollars as a share of income fade out quickly as income rises, dollars missed in the survey remain sizeable high up in the income distribution. Throughout the income distribution, accounting for unreported dollars from our four programs makes a larger difference than adding reported amounts of our two noncash programs to cash income.

Table 2 compares dollars received and reported from SNAP, public assistance, and housing assistance as well as these programs combined in New York State in 2008–2011 by bins of annual reported pretax household money income relative to the poverty line.¹³ The definition of the income bins uses survey data only, since we are primarily interested in how accounting for misreporting changes our views of the economic conditions of individuals at different points in the income distribution, based on the typically available data. Throughout the income distribution, program dollars reported are much lower than the administrative numbers.

The first row of each panel (for all programs first and then each program separately) contains estimates of program dollars received from the CPS survey data. The second row replaces the survey reports of program dollars received by the numbers recorded in the administrative data. Focusing first on those with reported incomes

¹² The survey questions we use to identify disabled individuals were added to the CPS in survey year 2009, so our analyses of households with a disabled member start with reference year 2008 rather than 2007.

¹³ Results using our SPM-type income measure to define the income bins are in online Appendix Table A4, and we discuss the main differences at the end of this section.

TABLE 2—SURVEY AND ADMINISTRATIVE AMOUNTS RECEIVED BY PROGRAM, BY ANNUAL REPORTED PRETAX MONEY INCOME DIVIDED BY POVERTY LINE, CPS NY SAMPLE, 2008–2011

	Categories of annual reported income relative to poverty line				
	<50%	50–100%	100–150%	150–200%	>200%
<i>All programs combined</i>					
Dollars received per person survey	\$1,553	\$1,302	\$612	\$369	\$50
Dollars received per person admin	\$2,991	\$2,850	\$1,630	\$970	\$230
Dollars missing per person in survey	\$1,438	\$1,548	\$1,018	\$600	\$180
... as share of reported cash income	110.2%	28.3%	11.6%	4.9%	0.4%
Net dollar reporting rate	52%	46%	38%	38%	22%
Reported noncash benefits (percent of cash income)	104.0%	21.5%	6.3%	2.4%	0.1%
<i>Food stamps</i>					
Dollars received per person survey	\$780	\$669	\$337	\$174	\$22
Dollars received per person admin	\$914	\$884	\$464	\$306	\$70
Dollars missing per person in survey	\$135	\$214	\$127	\$131	\$48
... as share of reported cash income	10.3%	3.9%	1.4%	1.1%	0.1%
Net dollar reporting rate	85%	76%	73%	57%	31%
<i>Public assistance</i>					
Dollars received per person survey	\$193	\$119	\$48	\$78	\$5
Dollars received per person admin	\$567	\$306	\$91	\$90	\$17
Dollars missing per person in survey	\$373	\$187	\$43	\$12	\$13
... as share of reported cash income	28.6%	3.4%	0.5%	0.1%	0.0%
Net dollar reporting rate	34%	39%	53%	87%	27%
<i>Housing assistance</i>					
Dollars received per person survey	\$578	\$510	\$218	\$117	\$23
Dollars received per person admin	\$1,509	\$1,660	\$1,076	\$574	\$142
Dollars missing per person in survey	\$932	\$1,150	\$858	\$457	\$119
... as share of reported cash income	71.4%	21.0%	9.8%	3.7%	0.3%
Net dollar reporting rate	38%	31%	20%	20%	16%
Share of individuals	5.5%	7.9%	8.7%	8.0%	69.8%
Income per individual	\$1,305	\$5,474	\$8,782	\$12,240	\$40,538
Number of household observations	689	1,045	1,143	1,000	8,269

Notes: The estimation uses households with at least one PIKed member only; weights are adjusted for PIK rates. Income categories are defined based on pretax money income; poverty thresholds are the official poverty thresholds. Dollars received are 2012 dollars, but are not adjusted for household size.

below half the poverty line in column 1, the first two rows of Table 2 show that while \$1,553 in program dollars are reported per person, actual receipt is \$2,991. Thus, measures of income that use the CPS reports of government transfers make individuals in deep poverty look substantially worse off. And those reported to be in deep poverty are not a small group—they are 5.5 percent of all individuals. As shown in the third row, more than \$1,400 in transfer payments are missing in the survey data per person. This makes an important difference for a poor family as, shown in the fourth row, it adds up to 110 percent of their reported cash income.¹⁴ Reported cash income can be found in the second line from the bottom of the table. In other words, the dollars from the four programs we examine that are *not* reported

¹⁴ Note that the base for this percentage includes reported public assistance, but neither food stamps nor housing assistance. We use this denominator for consistency as the numerator changes, but reported cash income also is the most commonly used measure of resources in the CPS and is used to compute the official poverty rate. It therefore provides a good illustration of the magnitude of survey errors relative to the resources included in official statistics.

in the survey exceed the amount of cash income that *is* reported by this group. The fifth row of each panel contains the dollar reporting rate, i.e., the percentage of dollars received that are reported in the survey, which is just over half at 52 percent for all programs combined for those in deep poverty. To put the magnitude of missing transfer dollars into context, the last row for all programs combined contains the amount received from the two noncash programs (food stamps and housing assistance) according to the survey as a proportion of reported cash income. This ratio is 104 percent for those reported to be in deep poverty, smaller than unreported benefits as a percent of reported cash income. Including the experimental housing-subsidy amounts in income rather than those on the ASEC file (in online Appendix Table A3) improves the fraction of resources of the very poor that are captured by the survey, but the missing transfers still amount to 83 percent of reported cash income.

Consequently, accounting for misreporting substantially improves measures of well-being of individuals in deep poverty, so individuals at the bottom of the income distribution are less severely deprived than the survey data suggest. In addition, that the survey misses a large share of income of the very poor likely makes measures of inequality look worse, particularly since many common measures of inequality are most sensitive to values in the tails of the income distribution. Many recent academic papers and policy reports have emphasized including noncash benefits in income when measuring poverty (National Research Council 1995 is an important example). This idea is a key element of the Census Bureau's new Supplemental Poverty Measure. Reported benefits from the programs we examine here account for a large share of the differences between such SPM-type and the official poverty rate (see, e.g., figure 8 in Short 2015). We find that the increase in available resources from adding unreported benefits from the four programs is larger than the reported amount received from the two noncash programs. This suggests that the change in well-being of the poor when correcting for misreporting may be comparable to or larger in magnitude than the change when moving from a pretax money income measure to an SPM-type definition that includes survey reports of in-kind benefits.

A. Subpopulations

Repeating the analyses for disadvantaged subpopulations reveals that the CPS understates resources of households with a disabled member and single mother-headed households even more severely. Missing dollars per person in deep poverty are higher than the overall average by about 30 percent, or \$500 for both groups. Single mother-headed households in deep poverty have more than \$2,000 per person in additional income than the CPS suggests from our four programs alone. Adding these benefits to pretax money income increases their resources by more than 150 percent. In comparison, adding the survey measures of food stamps and housing assistance only represents an increase of 135 percent (\$1,734).

B. Relative Importance of Programs

Misreporting not only understates the importance of transfers overall, but also makes programs with somewhat higher reporting rates, such as SNAP, appear

relatively more important for low-income individuals. With annual transfers of \$914 per individual in deep poverty, food stamps are a more important resource than public assistance, but substantially smaller than housing assistance. However, 85 percent of food stamp dollars received by individuals in deep poverty are reported in the CPS, while housing and public assistance have low dollar reporting rates in this income category (38 percent for housing assistance and 34 percent for public assistance). The higher reporting rate makes SNAP appear to be the most important transfer program for those in deep poverty: in the survey data, it accounts for slightly more than half of transfer income received from any of the programs we analyze. However, the administrative data reveal that it makes up less than a third of total dollars received and that housing assistance is a more important resource for individuals in deep poverty.

C. Missing Dollars as Income Rises

Missing program dollars, as a share of income, fall quickly as income rises. For those between half the poverty line and the poverty line, the unreported dollars add up to 28 percent of reported income. The decline continues above the poverty line as reported cash income is almost ten times higher than missing transfers for those in near poverty (100–150 percent of the poverty line) and more than 20 times higher for individuals between 150 and 200 percent of the poverty line. As a share of income, missing dollars become almost negligible after that.¹⁵ This fade-out is mainly driven by the rapid increase in income and reinforced by declining total amounts received from government programs. However, throughout the income distribution, adding unreported dollars continues to increase available resources by a larger amount than does including reported noncash benefits in the income definition.

For the subpopulations, amounts received are higher and reporting rates comparable, so substantial absolute dollar amounts are missing in the survey at higher income levels as well. For the disabled and elderly, more than \$2,000 per person are missing between 50 and 100 percent of the poverty line, and more than \$1,600 are missing between 100 and 150 percent. For single mother-headed households below 150 percent of the poverty line, missing dollars are slightly lower, but both received and missing dollars remain sizably higher in the income distribution. Between 150 and 200 percent of the poverty line, missing dollars still add up to 10 percent of reported cash income for these households. Even for individuals in single mother-headed households that belong to the upper half of the income distribution (with income that exceeds four times the poverty rate), the survey numbers fall short of actual benefit receipt by \$414 per person.

The main reason why missing dollars remain sizeable in higher income ranges is that reporting rates decline with income. While slightly more than half of transfer dollars received in deep poverty and almost half (46 percent) of dollars received between 50 and 100 percent of the poverty line are reported, only 38 percent of dollars received between 100 and 200 percent of the poverty line and an even smaller

¹⁵ As online Appendix Table A3 shows, using experimental housing-subsidy amounts only affects the level of these numbers, but has little effect on the rate of decline as income rises.

20 percent of dollars received higher up are captured by the CPS. Reporting rates that decline with income not only make simple corrections for misreporting inaccurate, but also imply that transfer payments become less and less visible in the survey data as income increases. Consequently, studies of those that have annual incomes well above the poverty line but still receive transfers, such as those with volatile incomes or those who mix work with welfare receipt, are likely to be particularly affected by the problem of underreporting.

In summary, we find that underreporting in the CPS causes us to severely underestimate resources available to low-income households and thereby makes poverty look more severe and inequality worse. As a share of income, the understatement of resources in the survey data fades out at higher income levels, but does so slower for the elderly, disabled, and single mothers. Using the SPM-type income measure instead of reported cash income to form the income bins changes our results slightly, but does not affect the main conclusions. Results are reported in online Appendix Table A4.¹⁶

III. Poverty Reduction and Program Effects

The poverty reduction due to government transfers is one of the most important indicators used to evaluate the effectiveness of individual transfer programs as well as overall government policies to reduce economic deprivation. Most of such analyses, regardless of the indicator of effectiveness they employ, are based on survey data, since other data sources rarely provide the required family characteristics.

In the calculations below, we consider anyone to be moved out of poverty by a program if their nonprogram income is below the poverty threshold, but exceeds it when adding benefits received from the program. These statistics have two well-known caveats. First, they do not account for behavioral earnings responses, which have been found to be small in the aggregate for the programs we examine (Ben-Shalom, Moffitt, and Scholz 2012).¹⁷ In cases where behavioral effects are likely to be important, our results provide an important starting point from which adjustments can be made that are likely to be less certain than the static part of the estimates. Second, more than one program may receive credit for moving a given household out of poverty if they individually raise the household above the poverty threshold. Of course, when we look at the effect of combinations of programs, this double counting is removed. We focus on 2008 to 2011 because we have administrative data on all programs for these four years. The average poverty rate, excluding the four programs we examine (i.e., according to reported cash income without public assistance), was 13.6 percent over this time period.

Table 3 shows that the four programs moved a much larger fraction of people out of poverty than the CPS suggests. Including reported benefits from the four programs in the income definition reduces the average poverty rate by 2.8 percentage

¹⁶ Most notably, both dollars received and missing dollars are lower up to 150 percent of the poverty line and higher above this threshold. This result holds both in absolute terms and as a share of cash income. The main reason for this pattern is that including reported government transfers in the income definition moves many individuals, particularly transfer recipients, to higher income bins.

¹⁷ Specifically, on page 738, they argue that the anti-poverty “impact is only negligibly affected by work incentives that in the aggregate, have almost no effect on the pretransfer rates of poverty in the population as a whole.”

TABLE 3—REDUCTION IN POVERTY, DEEP POVERTY, AND NEAR POVERTY DUE TO TRANSFER PROGRAMS ACCORDING TO SURVEY AND ADMINISTRATIVE DATA, CPS NY SAMPLE, 2008–2011

	Entire population: Deep poverty (baseline: 6.0%)				Single mother-headed households: Deep poverty (baseline: 21.4%)			
	Survey	Admin	Difference	Percent of survey	Survey	Admin	Difference	Percent of survey
All programs combined	2.48%	3.33%	0.85%	34.28%	11.52%	15.93%	4.40%	38.23%
SNAP	1.38%	1.57%	0.19%	13.68%	6.59%	6.77%	0.17%	2.65%
Public assistance	0.42%	0.89%	0.47%	112.75%	2.25%	4.71%	2.46%	109.46%
Housing assistance	0.76%	1.84%	1.08%	142.23%	3.53%	9.72%	6.19%	175.09%
Public assistance and SNAP	1.85%	2.39%	0.54%	29.35%	8.79%	10.98%	2.19%	24.92%
	Poverty (baseline: 13.65%)				Poverty (baseline: 37.5%)			
	Survey	Admin	Difference	Percent of survey	Survey	Admin	Difference	Percent of survey
All programs combined	2.79%	5.29%	2.50%	89.7%	7.30%	18.34%	11.04%	151.20%
SNAP	1.59%	2.09%	0.50%	31.2%	3.47%	5.00%	1.52%	43.85%
Public assistance	0.19%	0.47%	0.28%	149.7%	0.28%	1.81%	1.53%	548.28%
Housing assistance	0.86%	2.56%	1.71%	199.1%	0.71%	7.68%	6.98%	986.70%
Public assistance and SNAP	1.89%	2.75%	0.86%	45.2%	4.90%	8.32%	3.41%	69.62%
	Near poverty (baseline: 22.3%)				Near poverty (baseline: 51.5%)			
	Survey	Admin	Difference	Percent of survey	Survey	Admin	Difference	Percent of survey
All programs combined	1.18%	4.33%	3.14%	265.48%	2.31%	11.43%	9.12%	394.07%
SNAP	0.57%	1.06%	0.48%	84.10%	1.42%	3.39%	1.97%	139.20%
Public assistance	0.15%	0.24%	0.09%	59.53%	0.19%	1.04%	0.85%	436.21%
Housing assistance	0.31%	2.43%	2.12%	674.00%	0.54%	4.89%	4.35%	811.13%
Public assistance and SNAP	0.74%	1.42%	0.67%	90.45%	1.61%	4.59%	2.98%	184.73%

Notes: This table's observations are based on 12,146 households for the entire population and 1,072 for single mothers. The poverty rate is the share of individuals in households with income below thresholds. The baseline poverty rates use pretax cash income, excluding public assistance as the income definition. Poverty thresholds are the official poverty thresholds; individuals in households below 50 percent of the threshold are in deep poverty, and those below 150 percent are in near poverty.

points, while including benefits according to the administrative data reduces it by 5.3 percentage points. Thus, when taking underreporting into account, all programs combined move another 2.5 percent of the population out of poverty. Consequently, the overall poverty-reducing effect of the four government transfer programs is almost twice as large as the CPS indicates. Housing assistance appears particularly more effective when using the administrative numbers, moving an additional 1.7 percent of all individuals out of poverty. It thereby has the largest poverty-reducing effect of the programs we examine. However, this reduction is severely understated in the survey data, where it is only half as large.¹⁸ Excluding housing assistance entirely, the poverty reduction of SNAP and public assistance combined was 1.9 percentage points in the CPS and almost 50 percent higher in the linked data (2.8 percentage points). Most of the reduction is due to SNAP (2.1 percentage points), and only 0.5 percentage points are due to public assistance.

¹⁸ The results in online Appendix Table A5 show that understating housing-subsidy amounts plays an important role in these analyses. The experimental housing-subsidy amounts suggest a substantially higher poverty-reducing effect of housing assistance (2 percentage points) and all programs combined (3.9 percentage points). While this is an improvement, fully correcting for underreporting still increases the poverty reduction by about a third of the (already improved) survey estimates.

A. Subpopulations

The poverty-reducing effects and the differences between the administrative and the survey measures are striking for single mother-headed households and those with a disabled member, due to their higher program receipt. Results are reported in the right panel of Table 3 for single mothers and in online Appendix Table A6 for households with an elderly or disabled member. While average poverty rates according to the base income measure are lower for households with elderly members (10.0 percent), they are higher for those with a disabled member (19.8 percent) and those headed by single mothers (37.5 percent). All programs combined account for a 10.2 percentage point reduction in the poverty rate for disabled households and 18.3 percentage points for single mother-headed households. For the latter, the survey only captures a poverty reduction of 7.3 percentage points. Consequently, a poverty reduction of 11.0 percentage points, over 1.5 times that in the reported data, is missed when only using the survey data.

As Table 3 shows, the difference for single mother-headed households is primarily due to the large impact of housing assistance, which has poorly reported receipt and poorly imputed amounts. The poverty reduction due to housing assistance in the CPS is only 0.7 percent, while the administrative numbers show that the decrease exceeds 7 percentage points, i.e., its poverty-reducing effect for single mothers is 10 times higher than the CPS suggests. This understatement is drastically reduced (to 25 percent for housing assistance and 49 percent overall) when using the experimental housing-subsidy amounts.¹⁹ These findings underline that substantial improvements to the survey-based estimates are feasible, but also that studies of subpopulations should be particularly cautious about survey errors. Public assistance also has a much larger effect on the poverty rate for all three subgroups than the effect recorded in the CPS: using the administrative measure, it is 5 times larger than recorded for households with a disabled member and 6.5 times larger for households headed by a single mother.

B. Higher Income Thresholds

The comparisons above show that the CPS poorly measures the number of people moved across the federal poverty threshold, but the literature frequently considers other income cutoffs. Reporting rates decline with income, so while government programs become less important at higher income thresholds, the fraction of their effect that is missed in the CPS also becomes larger. For example, 22.3 percent of individuals live in near poverty, i.e., in households with base income below 150 percent of the federal poverty line. The four government transfer programs reduce this rate by 4.3 percentage points. Thus, their effect is indeed smaller in absolute numbers than their effect on poverty. However, only a 1.2 percentage point decrease in near poverty is captured by the survey reports. Consequently, the programs move more than 3.5 times as many people out of near poverty as the CPS suggests, making them

¹⁹Online appendix Tables A6 and A7 show that the improvements are less sharp, but still substantial for the elderly and the disabled.

look substantially more effective when correcting for misreporting. The CPS indicates that government transfers only move 0.6 percent of the population across twice the poverty line, while the linked data reveal that they move 2.8 percent across this threshold. For the disadvantaged subpopulations, the differences between the survey and administrative effects are often larger at higher thresholds. Of the 11-point reduction in near poverty for single mother-headed households, only 2 percentage points can be found in the CPS. Similar results are found at twice the poverty line.

C. Poverty Gaps

Next, we examine the poverty gap and how much of it is filled by government transfers. The poverty gap, the total dollars needed to raise all households to the poverty line, has been emphasized by many researchers as better capturing deprivation (see, e.g., Ravallion 1996, Deaton 1997). Correcting the survey data for underreporting increases the share of the poverty gap filled by the four programs by 44 percent; they now fill about half of the poverty gap rather than one-third of the gap. As with the poverty rate, housing assistance is the most important program, filling more than a quarter of the poverty gap. Food stamps are almost as important, filling 23 percent of the poverty gap, while public assistance accounts for an 11 percentage point reduction.²⁰ Both housing and public assistance are poorly reported and thereby, with about half of their effect missing in the survey data, appear much less effective at narrowing the poverty gap. SNAP is reported more accurately, but almost a quarter of its effect is missing nonetheless.

The survey data also miss a large share of the poverty gap that is filled for the disadvantaged subgroups. Even though the poverty gap is of similar magnitude for them, government programs fill a larger share of it for households with disabled members (62 percent) and single mother-headed households (67 percent). Again, the differences between survey and administrative data are striking. For example, the survey misses a 10 percentage point reduction in the gap due to public assistance and a 22 percentage point reduction due to housing assistance for single mother-headed households.

D. Changes over Time

Due to measurement error, the survey data may not only misrepresent the level of poverty and program effects, but also how they change over time as trends in misreporting magnify or hide trends in poverty. We focus on how accurately the CPS reflects the effect of the government program expansion during the Great Recession. According to our base income measure, the poverty rate grew steadily between 2008 and 2011, from 12.7 percent to 14.4 percent, i.e., a 1.7 percentage point (13.8 percent) increase. However, when including transfers, the poverty rate only grew by 0.8 percentage points (7 percent) according to survey reports and 0.3 percentage points (4 percent) according to the administrative measures. Neither of the measures

²⁰Note that the contributions of the individual programs add up to more than their joint contribution, since pooling them leads to a larger amount being spent above the poverty line.

that include transfers suggests an economically large increase in poverty over the recessionary period,²¹ but the increase is more than twice as large when relying on survey data only. The expansion of government benefits successfully dampened the increase of the poverty rate because the poverty-reducing effect of the programs kept up with its increase: according to the administrative data, the poverty reduction due to all programs combined increased from 4.5 to 5.9 percentage points between 2008 and 2011. In the survey data, the poverty-reducing effect of all programs combined grew by 1 percentage point from 2.1 to 3.1 percent between 2008 and 2011, quite a bit less than the 1.4 percentage point increase we see in the linked data. The difference is mainly due to increased underreporting of SNAP. This result shows that trends in reporting can affect trends in measured outcomes.

The results are overall similar, but less pronounced when looking at our SPM-type income measure. This difference is mainly due to fewer people being poor according to the SPM-type income. In summary, transfer misreporting not only makes the economic situation of low-income households look worse, but also causes the poverty-reducing effect of government transfer programs to be greatly understated. We find that regardless of the measure of poverty used, underreporting makes poverty look higher in survey data and severely understates the effectiveness of government policies in reducing economic hardship. Particularly for the disadvantaged subpopulations, government programs have a strikingly larger effect on measures of poverty than indicated in the CPS. The CPS is the source of the official poverty rate and thereby an important source of information that guides anti-poverty policies. Underreporting of transfer receipt therefore makes government efforts to reduce poverty appear much less effective. Maybe even worse, since measures of the cost of government programs are usually based on administrative data, underreporting in surveys has an uneven effect on cost-benefit analyses.

IV. Holes in the Safety Net

Another important criterion used by researchers to evaluate government transfer programs and the overall safety net is how well they reach people in need. We focus on single mothers who have little or no income from both work and welfare programs. This group has been called disconnected single mothers and has received particular attention in the literature (Turner, Danziger, and Seefeldt 2006; Blank and Kovak 2009; Bitler and Hoynes 2010; Loprest 2011; Loprest and Nichols 2011). The government programs for which we link data are particularly relevant for single mothers. However, we expect misreporting to make the safety net look substantially worse for other disadvantaged groups as well, since the consequences of misreporting loom particularly large in such studies for several reasons. First, the measures of interest are very sensitive to the common failure to report program receipt in surveys. Second, unlinked administrative data usually do not contain the covariates required to isolate particularly poor populations, so these kinds of analyses usually have to rely on survey data. Finally, reporting rates are known to differ by

²¹ This is in line with Sherman (2011), who relies on a simple imputation of missing program benefits and finds that programs fill in nearly the entire drop in income in the recession.

TABLE 4—SINGLE MOTHER-HEADED HOUSEHOLDS WITHOUT PROGRAM RECEIPT OR EARNINGS ACCORDING TO SURVEY AND ADMINISTRATIVE DATA, CPS NY SAMPLE, 2008–2011

Included programs	No earnings and program receipt			Low earnings and program receipt		
	Survey	Admin	Percent	Survey	Admin	Percent
			overstatement			overstatement
Public assistance only	17.1%	12.8%	34%	22.8%	17.1%	33%
Public assistance and food stamps	5.3%	3.2%	68%	7.4%	5.1%	46%
Public assistance, food stamps, and housing	3.6%	1.7%	113%	5.1%	3.0%	71%
All cash transfers	5.4%	3.6%	50%	9.8%	7.0%	40%
All cash transfers and food stamps	Numbers too small to disclose			3.5%	1.9%	82%

Notes: This table is based on 578 observations. All definitions restrict the sample to households below twice the poverty line headed by an unmarried female age 18–54, not in school with at least one own, grand, related, or foster child present in the household. In columns 2–4, we consider households that have no earnings and receive none of the programs in the first 3 columns as left behind; columns 5–7 also include those with yearly earnings less than \$2,000 and combined program receipt of less than \$1,000 (2005 dollars). “All cash transfers” includes unemployment compensation, Social Security, SSI, PA, education assistance, workers’ compensation, veterans’ payments, survivor income, disability income, retirement income, child benefits, alimony, and financial assistance. The estimation uses individuals in the household with at least one PIKed member only; weights are adjusted for PIK rates.

demographic group (Meyer, Mittag, and Goerge 2018), so using survey data alone to determine which demographic groups the safety net fails to reach is particularly problematic.

Table 4 reports the percentage of single mother-headed households who are missed by the safety net according to survey reports and administrative program receipt for 2008 to 2011. The first row uses the definition from Blank and Kovak (2009), which considers anyone disconnected who does not work and does not receive TANF, but we also include General Assistance, since much of what used to be TANF is now under the General Assistance program. In line with their definition, we only consider single-female household heads under age 55 and exclude full-time students and households with income higher than twice the poverty line. Also following their approach, we initially require no earnings and no benefits in the left panel of Table 4, but then allow up to \$2,000 in annual earnings and \$1,000 in benefits from all programs combined in the right panel.²² Even for the definition of Blank and Kovak in the first row, which is only affected by failure to report public assistance, the CPS overstates the number of single mother-headed households without earnings and access to the safety net by 34 percent. While allowing for some earnings and program receipt increases the numbers of households left behind, it does not decrease the extent to which the survey overstates the gaps in coverage of the safety net. The survey continues to overstate the number of households by 33 percent, so that according to the CPS, slightly more than 5 percent of all single mother-headed households seem to fall through the cracks of the safety net even though they are in fact program recipients, as we see in the administrative data.

The problem that survey data overstates holes in the safety net is not due to the particular definition used by Blank and Kovak, but arises regardless of how we use the survey data to measure the coverage of the safety net and extreme deprivation. Taking more transfer programs into account makes the safety net look much more effective at reaching disadvantaged populations, but does not alleviate the problems

²² For comparability with their definition, all amounts are in 2005 dollars.

caused by underreporting of government transfers. In the remaining rows of Table 4, we consider several definitions of being missed by the safety net, varying what programs we include. Going down the rows of Table 4 underlines two patterns. First, we see that a large share of those who neither work nor receive public assistance do receive other cash or noncash transfers. Including noncash benefits particularly affects the number of households the safety net fails to reach: adding food stamp receipt reduces the fraction by 75 percent (70 percent for the low income and benefits definition). This reduction is larger than the effect of including reported receipt of all other cash programs combined. Accounting for housing assistance, as well, reduces the remaining number by over 30 percent.²³

Second, regardless of which programs are included in the definition, the third and sixth columns of Table 4 show that the extent to which the safety net fails to reach those in need depends substantively on whether or not we use the administrative data to measure program receipt. Depending on which additional programs we include, the extent to which the CPS overstates the fraction of single mothers that neither work nor participate in any of the programs rises to between 50 and 113 percent in the survey data. The range of overstatement is slightly lower (40 to 82 percent) when including households with low earnings and low benefit receipt, but the survey data still make the coverage of the safety net and its ability to reach disadvantaged individuals look much worse. In fact, including additional programs aggravates the problem of underreporting. The fraction of single mothers who appear to fall through the cracks, but actually receive one or more of the government benefits according to the administrative data, increases as the definition of the safety net becomes more inclusive. While 25 percent of those who appear to be left behind when only considering public assistance do in fact receive program benefits, this share rises to more than 40 percent when including food stamps and housing assistance. Finally, more than 75 percent of those who appear to be left behind in the survey when including all cash and noncash transfers are actually covered by one or more of the programs.²⁴ On the positive side, the CPS correctly reflects the pattern of the time trend. The administrative and the survey data agree on the fact that both the number and the share of single mothers the safety net fails to reach increased initially during our time period and declined as the economy improved.

The exaggeration of the extreme left tail of the income distribution seems to be a common effect of program misreporting. Other measures that heavily weight these outliers are likely subject to substantial error. For example, the share of individuals with income below \$2 per day (e.g., Ravallion, Chen, and Sangraula 2009; Shaefer and Edin 2013) is likely to be overstated in surveys due to program misreporting. In most cases, receipt of a single government program is sufficient to move a household out of this category. Thus, the pervasive failure to report program receipt at all

²³ Using the housing assistance amounts from the experimental poverty file does not affect this substantively. It only marginally decreases the reduction for the low benefits definition.

²⁴ When including all cash and noncash programs, 0.8 percent of households are left behind according to the survey and 0.2 percent according to the administrative measure. These numbers are for 2007–2012 because the sample size using 2008–2011 is too small to allow disclosure. The numbers are not included in Table 4 and understate the difference between survey and combined data as housing assistance is not corrected in 2007 and 2012.

TABLE 5—REPORTED TRANSFER-PROGRAM RECEIPT AND DEMOGRAPHICS, UNITED STATES VERSUS NEW YORK, 2007–2012 CPS

	United States	New York
<i>Transfer receipt</i>		
Any program receipt rate	13.06%	16.04%
Average received (\$)	432	687
SNAP receipt rate	11.17%	12.43%
Average received (\$)	264	344
Public assistance receipt rate	2.12%	2.78%
Average received (\$)	49	73
Housing assistance receipt rate	3.67%	7.50%
Average received (\$)	118	270
<i>Demographics</i>		
Age under 18	24.42%	22.72%
Age 18–39	29.56%	30.28%
Age 40–64	33.06%	33.56%
Education less than high school	34.52%	33.16%
Education high school	23.08%	23.19%
Education some college	21.46%	19.55%
Black	12.75%	17.22%
Other nonwhite	8.05%	9.79%
Hispanic	16.27%	17.37%
Poverty rate	12.26%	13.85%

Notes: The average received is unconditional annual dollars. Housing assistance is CPS-imputed market values of reduced rent and public housing. For the demographics, the omitted category is “65 and older” for age, “college degree or more” for education, and “white” for ethnicity.

makes any entirely survey-based measure of extreme poverty likely to exaggerate true material deprivation.

V. Applicability to Other States, Programs, and Datasets

While our specific results pertain to New York, a large and important state, over a four-year period, it is very likely that our results are more general. As Table 5 shows, New York is similar demographically to the rest of the United States in terms of age, education, race, and the share Hispanic. The poverty rate in New York and the generosity of its welfare system are higher than in the nation as a whole. The most striking difference between New York and the rest of the United States is the frequency of public housing receipt. Our results on the importance of underreporting of housing assistance receipt and the understatement of the value of the assistance almost certainly overstate these problems for the rest of the “United States.”²⁵

However, several other studies have found reporting of SNAP to be worse in other states than what we find for New York. While evidence from validation studies for other states is scarce, it indicates that reporting is better in New York. Meyer, Mittag, and Goerge (2018) finds higher rates of misreporting in the CPS for Illinois and Maryland. Cerf Harris (2014) uses validated ACS data to show that the rates of false negatives are substantially higher in Texas than in New York. In terms of aggregate

²⁵ There is a bias in the other direction, though, since we do not have information on the substantial non-HUD housing programs, we understate the differences between the survey and complete administrative data.

comparisons, Meyer, Mok, and Sullivan (2015a, b) provide a detailed picture of dollar reporting rates nationally. As mentioned above, their results indicate that New York appears to have higher reporting than the national average.

More important, we are only able to correct for misreporting in four programs, SNAP, TANF, General Assistance, and housing assistance. Meyer, Mok, and Sullivan (2015b) documents that the CPS substantially understates receipt of other benefits including the Earned Income Tax Credit, unemployment insurance, Supplemental Security Income (SSI), workers' compensation, and Social Security (OASDI). While net reporting of OASDI receipt is better than for other programs, given its size and the evidence on the extent of underreporting of OASDI and SSI (e.g., Nicholas and Wiseman 2010), the dollars missed exceed those for any of the programs analyzed here. The reporting of pension income is likely even more important (Bee and Mitchell 2017). Our study would likely show much larger overall effects of unreported payments if we had access to accurate measures of receipt of these programs and pensions, particularly for those 65 and older.

Using data from a different survey, such as the ACS or the SIPP, may reduce some of the problems that we have noted, but introduces others. Program underreporting rates in the ACS and SIPP are lower than in the CPS (Meyer, Mittag, and Goerge 2018), but still substantial. The ACS does not record the amounts of key benefits, such as SNAP, while the SIPP has comparability issues across waves, particularly with the recent redesign. Thus, using other datasets does not solve the problem of survey errors.

VI. Conclusions and Implications

Previous work has documented that government transfers are substantially underreported in surveys, such as the CPS. Past work has not directly shown that substituting accurate measures for these error-ridden variables greatly changes the results of widely used analyses of important questions. The results in this paper show that using administrative data combined with survey data sharply alters our view of the well-being of households at the bottom of the income distribution and the effects of transfer programs. The corrected data indicate that those with very low incomes, specifically those below half the poverty line, have considerably higher incomes than reported. The underreporting of transfers is less important as income rises, but for some programs, such as SNAP and housing assistance, substantial dollars are underreported well above the poverty line. Throughout the income distribution, correcting for underreporting of our four programs has a larger impact on household resources than including reported noncash benefits from these programs. The omission of the latter is one of the principal arguments advanced for new poverty measures, such as the SPM. We also find that poverty rates are markedly lower and the poverty-reducing effects of government programs are much greater. All of these differences are much larger for disadvantaged groups, in particular single mother-headed households. In addition, we find that the fraction of nonworking single mothers missed by government transfers is much lower than previously reported.

Since income and program receipt are widely used in descriptive analyses, and as dependent and independent variables in causal studies, these results have broad

implications. Going beyond income and program receipt, this study shows that linked data can be a key tool to improve both the quality of available data and the accuracy of the estimates derived from these data. Therefore, besides the substantive contributions of the paper, it demonstrates the value of linking administrative data to an important and widely used survey dataset. This type of linkage is likely to be increasingly used to augment and remedy weaknesses of survey data. Many other countries, particularly in northern Europe, already provide researchers with secure access to linkable administrative records through research data centers or secure remote access (Commission on Evidence Based Policy Making 2017). In addition to replacing the survey reports by the more accurate administrative measure as we do here, linked data can also be used to improve survey data by examining imputations for item nonresponse and how they affect estimates (e.g., Bollinger et al. forthcoming; Hokayem, Bollinger, and Ziliak 2015; Meyer, Mittag, and Goerge 2018). A series of recent papers (Schenker, Raghunathan, and Bondarenko 2010; Davern, Meyer, and Mittag forthcoming; Mittag forthcoming) uses information from linked data to create better imputations.

Only a few studies attempt to correct for program underreporting in error-ridden survey data when linked data are not available (see, e.g., Scholz, Moffitt, and Cowan 2009 or Sherman 2011), but most do not. Meyer and Mittag (2017) and Mittag (2018) evaluate several corrections for underreporting, including the corrections applied by these papers. They show that even simple corrections can yield large improvements, but corrections can also make biases worse if key assumptions do not hold. Linked data can be used to study the conditions under which survey errors arise more generally and thereby point to the conditions under which surveys are likely to be (un)reliable (Celhay, Meyer, and Mittag 2017).

Another way to proceed in the absence of linked data is to improve the way we use survey data by being more cautious when they are known to be problematic. Policymakers and researchers interested in descriptive statistics on income can use the evidence on the direction and rough magnitude of the bias to assess the likely error in their statistics of interest. Academic researchers interested in causal inference rely on more complex models where the bias from misreporting depends on joint distributions of mismeasured and other variables. Since it is harder to assess the direction or magnitude of bias in these cases, further work with validation data is needed, but will be necessarily more context specific. Researchers can also avoid measures where misreporting is particularly severe altogether and rely on more robust measures, for example, by using consumption instead of income as a measure of income for the poor as Meyer and Sullivan (2003, 2008, 2011, 2012a, b) suggest.

In brief, our findings have important implications for survey producers and data users, including both policymakers and academic researchers. For survey producers, they highlight that misreporting in survey data is a first-order concern. For data users, our results amplify the call for caution with survey data. Beyond the extent of misreporting already documented in previous studies, our findings clearly show that errors in multiple mismeasured variables can lead to large cumulative biases. On the positive side, this study highlights that linking survey and administrative data can solve or greatly mitigate this problem.

DATA APPENDIX

A. Definitions of Subpopulations

Households with an elderly member are households in which anyone is 65 or older. A household is included in the subsample of households with a disabled member if anyone in the household gave a positive answer to any of the six disability questions. Since these questions were first included in the 2009 CPS, this subsample starts in reference year 2008. When we restrict the analysis to single mothers, we use households headed by an unmarried female (divorced, widowed, or never married) with at least one child under 18 present in the household (including foster, grand, and step children). We use a slightly different definition of single mother-headed households in Section IV. Following Blank and Kovak (2009), we exclude full-time students, those with incomes above twice the poverty line, and households headed by a female younger than 18 or older than 55.

B. Adjusting for Incomplete Linking

We link the administrative data to the survey data using the PIK as the linking variable. As described in Section I, the PVS of the US Census Bureau assigns PIKs to individuals in the survey data and the administrative records from matching records in a reference file. While PIKs are assigned at the individual level, we analyze program receipt and poverty at the household level. Our administrative data include information on all individuals in the assistance unit, so we can correctly infer the receipt status and amount received of all CPS households containing at least one recipient that was assigned a PIK in both the survey and the administrative records. The fraction of administrative records for which the PVS could not obtain a PIK is negligible at less than 1 percent. These administrative records that cannot be linked only amount to less than 0.5 percent of total SNAP and 1.8 percent of total Pennsylvania dollars received. Based on discussions with OTDA and inspecting the records, most records without a PIK are adjustments to prior payments and late payments to closed cases. Most households receive the programs we examine for multiple months, so that we are still able to link their receipt status. Thus, we can link practically all CPS households with at least one program recipient with a PIK to their program benefit history. However, survey households in which no individual has a PIK cannot be linked to the administrative data. In 9 percent of the households in the CPS data, no individual has a PIK, and we correct our estimates for this incomplete linking by adjusting the household weights using inverse probability weighting (see, e.g., Wooldridge 2007).

In particular, we define a binary variable in the survey data that equals one if anyone in the survey household is assigned a PIK. We then obtain the probability of a household having a PIK by estimating a Probit model using this variable as the dependent variable and demographic and economic characteristics of the household and its head as independent variables. The estimated coefficients are reported in online Appendix Table A1. Using these coefficients, we predict the probability of a household having at least one member with a PIK and multiply the household

weights by the inverse of this probability. We use these adjusted household weights in all analyses, which corrects the bias from incomplete linkage under the assumption that conditional on the covariates of the Probit models, whether the household is assigned a PIK does not predict program receipt or the amount received.

The adjustment above does not correct for failure to link households in which some members have a PIK, but none of the program recipients has a PIK. However, few households contain both individuals with and without a PIK. This first result is due to only 14 percent of individuals in the CPS being without a PIK and most of these individuals living in households where no individual has a PIK. Second, very few households contain both recipients and non-recipients. For a failed link, these two rare conditions need to both occur, and none of the recipients can have a PIK. In addition, these failed links make us overstate false positives (when receipt is incorrectly reported) and understate false negatives (when true receipt is not reported). Consequently, these linking failures make us understate the difference between the survey reports and true program receipt (see Meyer, Mittag, and Goerge 2018).

C. Definitions of Income and Program Variables

Our main income definition is pretax money income, which includes reported earnings and all reported cash transfers. The SPM-type measure adds in-kind transfers (food stamps and imputed market values of housing assistance, school lunch, Medicaid, Medicare, and employer health insurance contribution) and subtracts FICA, the federal retirement payroll deduction, and federal and state taxes (accounting for tax credits). We use market values and not fungible values of noncash transfers. For each definition, we use two measures: inflation-adjusted income in 2012 dollars and income divided by the poverty line. We use the federal poverty thresholds both for the poverty rate and for the normalization of income. We calculate them based on the total number of adults and children in the household and the age of the householder.

For all programs, we define program receipt at the household level, i.e., a household is a recipient household if anyone in the household receives the program. The CPS questions for food stamps and public assistance refer to any receipt in the previous calendar year, and we match the definition in the administrative data. We consider anyone to report housing assistance receipt who reports either subsidized rent or living in public housing. Both CPS questions for housing assistance refer to current receipt status, and we match this definition in the administrative data. Our housing data do not cover all types of public housing, so we consider a household to be a recipient of housing subsidies if it receives housing subsidies according to the survey *or* the administrative data. If it is a recipient in both sources, we use the administrative-subsidy amount.

We define the monthly housing subsidy as the difference between the rent of the unit and total tenant payments as recorded in the administrative data. The rent of the unit is missing for government-owned units (public housing). Twenty-nine percent of the households receiving housing subsidies in our linked data live in publicly owned housing units. For these households, we use the administrative records to

impute the rent as the average rental payment of housing assistance cases with the same number of individuals in the same five-digit zip code. We calculate annual amounts by multiplying current receipt by 12 both in the survey and in the administrative data. This convention overstates the amount for households that only received assistance for part of the previous year. For households in the administrative data, we could obtain the exact amount from the administrative data, but this is not possible for recipients of state-level and non-HUD programs. However, we are mainly interested in aggregate amounts and doing so would understate them because we would not include housing assistance received by households that received assistance, but did not do so in the interview month. As long as there are no seasonal trends in housing assistance, multiplying the monthly amount by 12 assigns some of the benefits to the wrong households, but yields unbiased aggregate amounts.

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