

**THE SURVEY OF INCOME AND
PROGRAM PARTICIPATION**

**LONGITUDINAL HOUSEHOLD
CONCEPTS IN SIPP:
PRELIMINARY RESULTS**

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PREFACE

This paper reports on research carried out with SIPP to define households over time and construct associated measures of social and economic well-being on an annual basis. The research, an extension of previous work with the 1979 Income Survey Development Program data, examines several alternative definitions of longitudinal households. Measures of annual low-income status and household composition experience during the year are compared across definitions to shed empirical light on problems of longitudinal measurement for households, including problems of presenting data for part-year households and for longitudinal households that had some composition change during the year.

INTRODUCTION

In this paper, we report on research to define households and their characteristics on an annual basis using intra-year longitudinal survey data. The research is examining alternative definitions of longitudinal households and measures of annual income status and family type under each definition. Our primary purpose is to shed empirical light on the improvements and also the problems in annual household statistics developed with longitudinal data that capture changes in social and economic status during the year. Secondly, our analysis provides evidence on the extent of intra-year change currently experienced by households in the United States.

Our data source is the 1984 Panel of the Survey of Income and Program Participation (SIPP).^{*} We also report on an earlier exploratory study (Citro 1985; Citro and Watts 1985) carried out with data from the 1979 Research Panel of the Income Survey Development Program (ISDP), the predecessor to the SIPP.

THE DYNAMICS OF HOUSEHOLD STRUCTURE AND INCOME

We know from a rich literature that household and family structure in the U.S. has changed markedly in recent decades and remains dynamic (see Koo 1985). Current trends include decline in the number of two-parent households, growth in single-parent, non-family, and one-person households, and decrease in average household size (Bureau of the Census 1985b). Most of our knowledge is of net change over annual or longer time spans. A few studies, using longitudinal data from the Panel Study of Income Dynamics (PSID) (Duncan and Morgan 1974, 1976, 1982; Duncan et al. 1984) and the Seattle and Denver Income Maintenance Experiments (SIME/DIME) (Devaney and Smith 1979), have looked at gross changes in household composition across

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one or more years.

Very recently, studies have appeared in the literature that examine gross household composition change on an intra-year basis. Czajka and Citro (1982), using data from the first two waves of the 1979 ISDP Research Panel, found, looking only at adult members, that about 6.5 percent of the Wave I households changed composition during Wave 2. Koo (1985), using all six waves of the ISDP, developed a lower bound estimate from cases with complete data that 10.6 percent of Wave I households had a composition change over a 13-month period. She estimated as an upper bound that over 30 percent of ISDP Wave I cases, including those where part or all of the household attrited, experienced change. Citro and Watts (1985) found in a randomly-drawn subsample of the ISDP of about 1,000 cases that 4 percent of Wave I households (unweighted) changed type (for example, from married-couple to single-parent family household) and another 11 percent changed size during a 12-month period. Their estimate of 15.5 percent of Wave I households experiencing some kind of change, based on a subsample that excluded cases of whole household attrition, is similar to Koo's preferred estimate of 19.3 percent.

There is an equally rich literature on the dynamics of household income and poverty, based on repeated cross-section and longitudinal panel data. Analysis of the PSID, now in its eighteenth year, has found evidence of considerable income instability in the U.S.--while the "hardcore" poverty population that remains below the poverty line year after year is relatively small, a much larger proportion of the population has experienced one or more years of poverty. (For example, only about 1 percent of persons were poor in every year of the PSID from 1967 through 1975, but about 25 percent experienced at least one poor year. See Duncan and Morgan 1978.) This

research has also amply documented that changes in family composition--the gain or loss of one more members--are important determinants of changes in poverty status (Duncan and Morgan 1974, 1976, 1982; Duncan et al. 1984). For example, of those families in the PSID sample in 1968 that had different heads in 1972, over 29 percent moved into or out of poverty comparing their incomes for 1967 and 1971; while, of those families that kept the same head, only 17 percent had a change in poverty status from the beginning to the end of the first five years of the panel (Duncan and Morgan 1974:tables 1.2 and 1.3).

Most of the extant work has looked at year-to-year income dynamics; relatively little is known about intra-year changes in income and their relationship with household composition change. Citro and Watts (1985) found a high level of monthly income stability within a subsample of the ISDP. Of those Wave I households that remained stable in composition during the year, 54 percent were never poor in any month, 16 percent were always poor, and the remaining 30 percent had some poor and some nonpoor months. (The proportions always poor and sometimes poor are undoubtedly overestimates because imputations for missing income were not performed in the ISDP database used for the analysis, and hence some households were erroneously assigned to the always and sometimes poor categories.) Of those original households that experienced a change in composition, almost 28 percent also exhibited monthly income instability during the period before the change. Newly formed households were most stable in income during the months of their existence within the span of observation--less than 17 percent of these households had both poor and nonpoor months. With regard to the association of changes in composition with economic change, Citro and Watts found that 17 percent of Wave I households that changed composition

moved into or out of poverty measuring their members' income before and after the change.

CURRENT ANNUAL HOUSEHOLD STATISTICS

Given both intra-year composition and economic change, troubling questions arise regarding the adequacy of our current annual household statistics derived from the March Current Population Survey (CPS). The CPS measures of income and poverty, as well as of household characteristics such as size and type (married-couple, single-parent family, etc.), simply ignore intra-year changes in household composition (Bureau of the Census 1985c). In the CPS, income is measured over the preceding calendar year for members of each sample household who were present in the following March, although not all of these members may have been part of the household during the income accounting period and some members present earlier in the year may have left before the interview. Moreover, income of members of sample households who died before the interview, were institutionalized, or moved abroad, i.e., who left the survey universe, is excluded entirely, while the entire annual income of new members who entered the universe is included. Similarly, the groupings of persons observed in March are the basis for statistics on household type, size, and other characteristics that are cross-tabulated with income and poverty. These statistics provides measures of net year-to-year change in household structure, but they implicitly portray all types of households as stable during the year.

Hence, there are real questions concerning the extent to which annual household statistics derived from the CPS correctly represent the experience of the population throughout the year or misrepresent that experience in important ways. The studies described above that analyzed ISDP data suggest

that sizeable proportions of households that the CPS implicitly represents as remaining stable during the entire year in fact experienced some type of change. Moreover, limited empirical evidence suggests that the CPS procedure distorts to some extent annual estimates of families and persons in poverty because of the different accounting periods used for family composition versus family income, although no work has been done that would indicate whether measures of change in poverty rates from year-to-year are also affected. Scardamalia (1978), using longitudinal SIME/DIME data, estimated an annual poverty rate for persons based on a CPS measure that was 5.4 percentage points higher than the rate estimated with a measure that aggregated monthly family income and poverty thresholds to determine each sample person's poverty status for the year. Czajka and Citro (1982) obtained similar although less striking (and possibly statistically insignificant) results using data from the first two waves of the 1979 ISDP Research Panel. They estimated a poverty rate for families measured over the first three months of the survey based on the composition of the family four months later that was 1.2 percentage points higher than a rate estimated for the first three months based on the composition of the family one month later.

What may underly the finding that the CPS definition of household income overstates poverty is that the CPS finds split family units in March that appear to have had little or no income in the previous calendar year (e.g., a recently divorced mother who did not work), when in fact the units were intact most or all of the previous year with sufficient income to raise them above the poverty line. Of course, the converse situation can also occur, namely families forming through marriage or remarriage between December and March, whose members' combined incomes during the previous year was above

the poverty line, but not their individual incomes, so that persons in these families would be reclassified as poor using a measure based on actual family composition instead of the CPS measure. At present, demographic trends toward formation of more and smaller households may be resulting in slightly more cases where households are misclassified as poor using the CPS measure than the other way around, although alternative explanations such as differential sample attrition merit attention.

IMPROVED ANNUAL HOUSEHOLD STATISTICS

The Potential of Longitudinal Intra-Year Data from the ISDP and SIPP

The 1979 Income Survey Development Program Research Panel represented the first effort to conduct a longitudinal survey of a large, nationally representative sample of households principally to obtain data on intra-year income and government program participation (see Ycas and Lininger 1981 for a description). Based on experience gained in the ISDP and other surveys, the Survey of Income and Program Participation was launched in the fall of 1983 as a continuing data collection vehicle for obtaining information on intra-year income and program participation in addition to other topics from large panels followed over periods of two-and-one-half years (see Nelson, McMillen, and Kasprzyk 1985 for an overview). The detailed income data in the ISDP and SIPP, obtained by month for most sources, and monthly data on household and family composition permit the measurement of intra-year changes in household composition and socioeconomic status. (A caveat to note is that the SIPP does not measure household composition change during the months covered by the first interview. This is also largely true of the ISDP. The ISDP suffers as well from errors in arrival and departure dates

of household members which were used to develop the monthly composition data.)

Information about part-year income and composition is important for many purposes, notably policy planning and evaluation for means-tested transfer programs that use part-year accounting periods for eligibility and benefit determination. However, the availability of regular part-year statistics from SIPP will not lessen the need for annual measures that document trends in living arrangements and in how the country fared economically over the year. In particular, there will continue to be a need for annual household statistics. Although measures of total annual available income and poverty status can be reported and analyzed for persons, they must be defined on a household or family basis. The income available to many persons is not simply their "own" receipts, but receipts earned or otherwise acquired by other members of the household or family. Similarly, standards of need recognize economies of scale for larger families. There is public policy interest in social and economic statistics for the units into which persons group themselves in addition to statistics on a person basis.

Both the ISDP and the SIPP are sources of the detailed income and demographic data needed to construct improved part-year and annual statistics. However, the sample size of the ISDP--about 7,500 original households in the first wave--is less than two-fifths of the sample size in the 1984 SIPP Panel. Moreover, the ISDP, as an experimental effort, suffered from a number of design and operational problems that make research use of the data problematic. Sufficient waves of data from the 1984 SIPP Panel have recently become available to permit the kind of analysis described here with a large, nationally representative sample.

The Challenge of Longitudinally-Based Annual Household Statistics

The SIPP data permit developing annual household statistics that better reflect actual experience during the year. Yet, perplexing methodological issues arise when one tries to construct such measures. There are complex questions involved in the development of appropriate longitudinal weights to account for sample attrition over time and of appropriate longitudinal imputation techniques for missing data. Another complex issue which is the subject of this paper concerns definition of households on a longitudinal basis. Given intra-year composition change, when is it appropriate for annual measures to recognize change in household composition and when is it not? For example, it may be that analysts would agree that the birth of a second child to a married-couple family is not enough of a change to warrant recognition of a new family, whereas gaining or losing a spouse is. There is likely to be less agreement on treatment of changes between these two extremes.

Researchers at the Census Bureau and other institutions have given considerable thought to the question of defining households and families on a longitudinal basis (Carr et al. 1984; Czajka and Citro 1982; Dicker and Casady 1982; Griffith 1978a, 1978b; Lane 1978, 1981; McMillen and Herriot 1984; Norton 1982; Siegel 1981; Ycas 1981). Considerations involved in choice of definition include: (1) research applicability, (2) ease of computation, and (3) feasibility of estimation. With regard to the suitability of various longitudinal definitions for annual measures of income and poverty status, views have been expressed that a definition that emphasizes continuity and produces a smaller number of longer-lived households will tend to result in a lower poverty rate compared with *

definition that recognizes many kinds of change and produces a larger number of shorter-lived households.

Implicit in this view are two important assumptions. The first is that households that undergo compositional change also tend to undergo economic swings in and out of poverty. The literature on inter-year socioeconomic change certainly supports this assumption, but the extent to which intra-year composition changes result in changes in poverty status measured over a total span of only 12 months remains to be established. The second important assumption starts from the premise that the proportion of households classified as poor is inversely related to the length of time over which income is measured. The literature on inter-year socioeconomic change has documented that more households have a poor year than are in poverty over a period of years; similarly, ISDP data show higher poverty rates on a monthly basis than measured over longer time periods (see Lane 1981). The corollary of this assumption is that, under longitudinal definitions emphasizing continuity, those households experiencing a change in poverty status associated with a composition change are more likely to be measured as not poor than poor based on their income overall. In contrast, definitions emphasizing change will identify a greater number of households in poverty. Again, this remains to be established within the context of a 12-month span of observation.

Opinions have also been expressed on a related issue of how to present longitudinal household statistics once a definition is chosen, given that any longitudinal definition will result in part-year households. One approach is simply to tabulate full-year and part-year households separately. However, this has the drawback that the sum of the two distributions will provide a count greater than the count obtained on a

cross-section basis at any point for the year and that each part-year household will count for as much in the combined distribution as each full-year household. Another approach is to tabulate full-year and part-year households together and to time-weight the latter, that is, count part-year households for only the fraction of the year each existed. This approach will produce an estimate that is close to cross-section estimates of the number of households, but the estimate based on time-weighting will represent "household years" rather than households per se and may, consequently, take some getting used to. Obviously, the question of tabulations interrelates with the choice of definition. Those definitions that emphasize continuity have the attraction of not producing as many part-year households, but continuity for continuity's sake may well mask important differences between households that truly do not change composition and those that are defined as continuous but in fact had one or more changes.

LONGITUDINAL HOUSEHOLD ANALYSIS WITH THE SIPP

Our analysis has a two-fold purpose. First, we want to assess the implications for annual statistics of intra-year changes in household composition and economic status by constructing annual measures of household type and economic status under several alternative longitudinal household definitions. Second, we want to describe patterns of intra-year household composition change and associated economic change.

Data Source

For our analysis we used the files maintained at the Census Bureau for each of the first four waves of the 1984 SIPP Panel in the version termed

"relational", that is, the version with separate linked record types for each of the major kinds of data collected in the survey--sampling unit, household, family, person, employment, and income. We extracted 12 months of data beginning with the first reference month of Wave I for each person in the sample who met the following criteria:

- o The person was a household reference person or spouse of reference person at least 1 of the 12 reference months; and
- o The person was never a member of a household that refused to be interviewed.

The data for persons in the extract file were then reorganized into data for longitudinal household units. Because of the staggered interviewing used in the SIPP, where one-quarter of the sample (called a rotation group) is interviewed each month, the 12 months of data for each record represent differing calendar periods. For rotation group 1, the period is June 1983 through May 1984; for rotation group 2, July 1983 through June 1984; for rotation group 3, August 1983 through July 1984; and for rotation group 4, September 1983 through August 1984.

Because of operational problems, we were unable to develop weighted estimates of longitudinal households from our extract files, but instead used unweighted counts with some adjustments (see discussion in a later section). In addition to biases introduced by the absence of weights, the unweighted counts are biased in several other respects that we review below. These biases will also affect any weighted estimates that are subsequently developed from our files.

The above extract file specifications exclude households for which information on composition changes is missing because of refusal to respond to one or more interviews after Wave I. (The SIPP files contain imputations

for individual persons who refused to be interviewed within an otherwise responsive household but no imputations in cases where the entire household refused an interview.) Hence, the numbers of longitudinal households constructed from the data under various definitions are biased downward in total. But, if households in the sample that refused one or more interviews experienced similar patterns of socioeconomic change as responding households, estimates of proportions, such as percentage full-year versus part-year households under one or another definition, will be unbiased. We assume for purposes of the analysis in this paper that households excluded because of refusal are similar to responding households on the variables that we examine.

In contrast to the treatment of refusals, our extract file retained the available data for households that were missing one or more interviews after the first wave because they dropped out of the sample, including households that left the universe because all members died, were institutionalized, moved abroad, etc., and households that moved too far away from a primary sampling area or for another reason could not continue to be interviewed. It is appropriate to count households that left the universe as existing only for the part of the year that they were in the survey. However, because the 1984 SIPP Panel had no provision for adding new sample cases representing households formed by persons entering the SIPP universe, our counts of longitudinal households ever existing during the year are biased downward compared with our starting count in the first month.

The situation with regard to households leaving the survey because they moved too far away, or a similar reason, is more complex. It may be reasonable to assume that a higher proportion of these households experienced composition change at the time they left the survey than was the

case for refusals. However, for every such mover household that did indeed change composition, we correctly count one part-year household that dissolved during the year but fail to count one or more new part-year households formed after the change. For every such household that moved but did not change composition, we correctly count only one household but treat it as a part-year rather than full-year household.

Overall, the net effect of the various inclusions and exclusions described above appears to be to underestimate the total number of longitudinal households ever existing during the year and also the total number generated by the cohort of households existing at Wave I. It also appears likely that the proportion of part-year households is underestimated relative to full-year households, hence affecting interpretation of the results on the extent of intra-year composition change. However, comparisons among alternative definitions of longitudinal household counts and proportions of part-year versus full-year households should be less affected, since these comparisons are based on data for the same set of persons.

The previous ISDP study by Citro (1985) excluded all households missing one or more interview waves because of lack of information on the reason for the missing data. As this study was never intended to develop universe estimates, the extent to which it underestimated the total number of longitudinal households was not a matter of concern. However, it is important to note that the Citro study probably underestimated the proportion of part-year longitudinal households and hence the extent of intra-year composition change to a greater extent than the SIPP analysis reported here. The Citro study also used unweighted data because of large variations in weights due to the complex ISDP design that greatly

exaggerated the effects of movement among tabulation cells of a handful of cases in the small subsample used for analysis. As discussed below, there is evidence that the use of weights for the SIPP analysis would not have materially changed the findings reported on the basis of unweighted data.

Longitudinal Household Definitions

Our primary analysis goal was to investigate development of annual household statistics that reflect intra-year social and economic change. Hence, we wanted to experiment with as many different types of longitudinal household definitions as practicable, and particularly to include definitions representing widely-spaced points along a continuum from definitions emphasizing continuity to those emphasizing change.

We began with two definitions that emphasize continuity:

- (1) Reference person definition: A household continues over time if it has the same reference person or householder.
- (2) Principal person definition: A household continues over time if it has the same principal person. This definition differs from the first in treatment of married-couple households for which the reference person may be either the husband or wife as designated by the household but the principal person is always the wife. For all other households, the principal person is the reference person (the person who owns or is renting the house). Unfortunately, operational problems prevented us from obtaining usable results for this definition, and we excluded it from the analysis. (Citro (1985) implemented the principal person definition with an ISDP subsample and provides comparisons with definitions (1), (3), and (4).)

We then implemented two definitions that emphasize change:

- (3) Family type definition: A household continues over time if it has the same reference person and if it is the same family type, where family type may be: married-couple household; other family household, male householder; other family household, female householder; nonfamily household, male householder; nonfamily household, female householder.
- (4) Type and size definition: A household continues over time if it has the same reference person, if it is the same family type as specified for definition (3), and if it has the same membership size.

Definition (3) will give different results from either of the first two definitions in a number of situations. For example, definition (3) will recognize dissolution of one household and formation of two new households in the case of a divorce. In contrast, the first definition will, in most cases, continue the husband's household and recognize only one new household, that of the wife, while the second definition will continue the wife's household and recognize only the husband's household as new after the divorce. As another example, definition (3) will always recognize dissolution of one household and formation of a new household where a couple living together subsequently marries. Definition (2) will recognize one continuous household in cases where the woman was the reference person prior to the marriage, as will definition (1) in cases where the same individual continues as the reference person.

Definition (4) is at one extreme of the continuum from minimizing to maximizing recognition of change, as this definition recognizes every single change in household membership, whether it be the birth of a child, the loss of a parent, or the arrival of a roomer. An exception to this statement is the case where there is continuity in family type but a simultaneous change in membership such that the number of household members leaving exactly balances the number arriving, so that there is no net change in size. However, it is expected that the number of these cases is very small.

Finally, we implemented a fifth definition, the one which the Census Bureau has developed and provisionally adopted for use with SIPP. This definition is based on the idea of the householder (or spouse) maintaining a certain role over time. Basically, three roles are distinguished: (1) the householder maintains a household for him or herself only; (2) the householder or spouse maintains a household for one or more relatives; and (3) the householder maintains a household for him or herself and one or more nonrelatives.

Definition (5) can be summarized operationally as six rules which are applied to households for two consecutive months at a time. Rule 1 is that a family household maintained by a married couple continues as long as the couple maintains a household. Rule 2 is that a family household not maintained by a married couple continues as long as at least one family member continues to live with the householder. Rule 3 pertains to cases in which a married-couple household is either preceded or followed by a situation in which the husband and wife were maintaining their own separate family households. Under rule 3, the married-couple household is continuous with one of the other family households if a majority of the family members in the married-couple household are also present as a majority of the family

members in the other household. Rule 4 is that a one-person nonfamily household continues as long as the householder maintains such a household. Rule 5 is that a multi-person nonfamily household continues as long as the householder maintains such a household. Rule 6 is that a household continues, if it changes type from nonfamily to family because two unmarried persons living together have become married to each other. In cases of conflict between rules 5 and 6, rule 6 takes precedence.

The Census Bureau's definition (5) can be seen as a hybrid of definitions (1-3) above, but it differs from the others in four significant ways. First, definitions (1-3) and the Census Bureau's definition continue a married-couple household for the months during which the couple maintains the household, but if the husband and wife maintain separate family households prior to or following the months when they jointly maintain a household, then, across this transition, definition (1) continues the family household by following the householder, definition (2) continues the family household by following the wife, and definition (3) does not continue the family household, while the Census Bureau's definition (5) continues the family household by following either the husband or the wife, depending upon which one lived with the majority of family members during both periods. Second, if a household changes from a family household to a nonfamily household, then definitions (1-2) view it as continuing, while definition (3) and the Census Bureau's definition (5) view it as not continuing. Third, if a household changes from a nonfamily household to a family household, then definitions (1-2) view it as continuing, and definition (3) views it as not continuing, but the Census Bureau's definition views it as continuing only if the change resulted from the marriage of two persons who had been living together prior to the marriage. Finally, definitions (1-3)

view a nonfamily household that shifts between one-person and multiple-person composition as continuing, but the Census Bureau's definition (5) views it as not continuing.

For a number of reasons, we did not construct the CPS retrospective household definition with our SIPP data. The SIPP does not contain complete income data for new sample members. There is also the problem that the longitudinal SIPP panels become less representative of the population over time. Operational problems prevented our using the cross-section weights developed by the Census Bureau for each month of the survey, but these weights could only have provided representativeness on a small number of basic demographic characteristics. In discussing our results, we suggest some implications for possible problems with the CPS definition.

Contents of Longitudinal Household Records

For each of the five definitions specified above, we constructed a file containing a set of fixed-length records, one for each longitudinal household, with the following variables:

- (1) Household status by month (1 for each month in which the household existed, 0 otherwise) and household duration in months;
- (2) Household size by month;
- (3) Family type by month;
- (4) Total household income by month and the sum of household income over the months of the household's existence;
- (5) Household low-income threshold by month and the sum of low-income thresholds over the months of the household's existence;
- (6) Demographic characteristics of the householder; and
- (7) Household weights and longitudinal adjustment factors.

Some of these items merit further explanation. All of the household social and economic characteristics from the SIPP relational files include the results of consistency edits and imputations for item nonresponse. These edits and imputations were performed on a cross-section basis separately for each wave. The Census Bureau has not yet implemented longitudinal edits or imputations that make use of information available from earlier and/or later waves. Hence, there is the likelihood that some changes in composition and economic status observed in our analysis files represent artifacts of the imputation process.

The duration variable measuring the number of months of household existence is a function of the particular longitudinal household definition used. It is important to note that duration is measured only within the 12-month span of observation. We do not observe (and do not need to for purposes of this analysis) the total duration of full-year households or households that existed at either the beginning or end of the 12-month period. We observe total duration only for a small number of households that both formed and went out of existence during the year.

The monthly low-income thresholds were constructed by the Census Bureau based on converting the U.S. Office of Management and Budget annual thresholds to a monthly basis adjusted for inflation. Each household was assigned a threshold for each month corresponding to its size and type in that month and with the appropriate inflation adjustment for the calendar month represented by the reference month (Bureau of the Census 1984b). To determine the household's low-income status over the time period of its existence, we divided the sum of the household's monthly incomes by the sum of the corresponding monthly low-income thresholds. Unfortunately, because of an error that occurred in developing the Wave III relational file, about

2 percent of the households in our extract files had missing low-income thresholds for 1 or more months of their existence. We omitted these cases from all calculations of low-income rates.

In the discussion of our results, we use the term "low-income status" and "low-income rate" in preference to "poverty status" and "poverty rate". Given that current measures of poverty are based on an annual needs standard which implicitly assumes that households with fluctuating incomes can be expected to save some of their incomes in good months to cover bad months, there is a serious question concerning the meaning of "poverty" measured on a subannual basis. Many longitudinal households exist for an entire 12 months of observation, and for these households the measure of low-income status is very similar to the current poverty measure. (The two measures are similar, but not exactly the same, because our low-income measure cumulates separate monthly thresholds that vary according to the specific household composition each month, whereas the current measure assigns an annual threshold based on a point-in-time measure of composition.) However, for part-year longitudinal households, there is a difference in the accounting period that can range from only 1 month (in the case of a household existing 11 months of the year) to as many as 11 months.

We originally intended to use in our analysis the cross-section weights developed by the Census Bureau for each person and household for each month of the survey with rough adjustments to approximate appropriate longitudinal household weights. (The Census Bureau has not yet developed weights specifically for purposes of longitudinal analysis.) These cross-section weights take into account both the sampling fractions used to select the original cases and nonresponse to the survey because of refusals or other reasons, and incorporate adjustments to bring the weighted counts up to

control totals for basic characteristics of the U.S. noninstitutionalized civilian population, including age, sex, and race (Bureau of the Census 1985a).

Operational problems precluded our using the cross-section weights. Instead, we gave each longitudinal household a weight of 1 except in two kinds of situations. First, if neither the reference person nor the spouse of a newly-formed household was an original sample person present at Wave I, we assigned such a household a zero weight. (An example would be the case where an original sample person living alone at the start of the survey moved into a household headed by persons who were not original sample people.) Secondly, if either the reference person or the spouse of a newly formed married-couple household was an original sample person, but both were not, we assigned that case a weight of one-half (0.5). These adjustments help maintain the representativeness of the sample cases over time. (See discussion of principles and procedures of longitudinal household weighting in Ernst 1985.) We see in table 1 that the unweighted distribution of households by family type for months 1 and 12 from our extract files and the weighted distribution for similar periods from published SIPP data are quite similar, giving us confidence that our results would not materially change with the addition of universe weights.

RESULTS

Below we construct and evaluate annual measures of household type and low-income status under four of our five longitudinal household definitions (1, 3, 4, and 5). Then, to shed light on the reasons for the similarities and differences in our measures, we describe the patterns of intra-year social and economic change experienced by households in our SIPP sample.

Annual Household Counts Under Four Alternative Longitudinal Definitions

Implementing the four definitions that we successfully constructed with the SIPP panel data generated a varying count of longitudinal households. As a point of comparison, we note that the data show a net increase between months 1 and 12 of 2.1 percent in the number of households measured cross-sectionally. (Weighted counts for the 3rd quarter of 1983 and 1984 from published SIPP data show a net increase of 1.8 percent--see table 1.) Definition (1), which recognizes households as continuing as long as the reference person remains the same, generated 19,734 longitudinal households or 8 percent more than the starting month 1 cross-section count of 18,323 households. Definition (3), which continues households only as long as both the reference person and the family type remain the same, generated 20,419 households, or 11 percent above the starting count. Definition (4), which continues households only as long as the reference person, family type, and household size all remain the same generated 22,819 households or almost 25 percent above the month 1 count. Finally, definition (5), the Census Bureau definition representing a hybrid, generated 20,636 longitudinal households or 13 percent above the month 1 count, similar to the results for definition (3). (These results are similar to those from the ISDP reported in Citro (1985), where definitions (1) and (2) generated 5 percent more households, definition (3) 9 percent more, and definition (4) 26 percent more longitudinal households than the month 1 count.) Applying time weights to the longitudinal households under each definition, that is, fractional weights for part-year households that existed only part of the year, gives a count of about 18,485 household years, or 0.9 percent above the starting month 1 count.

In terms of duration, close to 90 percent of longitudinal households under the first definition and over 80 percent under definitions (3) and (5) existed for the entire year; the average duration for the total was about 11 months in each case. Under definition (4), the average duration dropped to under 10 months due to a smaller number of full-year households (under 70 percent). Looking more closely at the part-year households generated by each definition, the predominant form of intra-year composition change recognized under the first definition involved the formation of new households as offshoots of continuing households, for example, adult children leaving the nest. Definition (3) recognized these kinds of changes as well, but, in addition, recognized changes in households with the same reference person that changed type (for example, from married-couple to nonfamily household or vice versa), resulting in higher counts both of dissolved and newly formed households. Definition (5) produced a similar distribution of part-year households by type as definition (3). Definition (4) showed the highest proportion of dissolved households and also of households that both came into being and went out of existence during the 12-month span. The average duration of part-year households overall--just over 5 months--did not differ among the four definitions. (Duration for dissolved and newly formed households is observed only within the 12-month period and not for the full spell of their existence. It is also the case that, because the SIPP survey design assumes stable household composition for the four reference months of Wave I, average duration is biased slightly upwards for dissolved households and slightly downwards for newly formed households.)

Implications of Alternative Longitudinal Definitions for Annual Household Type Statistics

Clearly, many households in the sample experienced changes in composition during the space of a year, with greater or lesser recognition of these changes by the various definitions. The question is whether different longitudinal household definitions have an effect on annual statistics. Is it appropriate, for example, to classify longitudinal households by initial family type, that is, their type as of the first month the household existed, and to what extent does such a characterization mask intra-year change?

It turns out that, on a time-weighted basis, the distribution of annual longitudinal households by initial family type is virtually the same regardless of which definition is used (see table 3). With time weights, the proportions of married-couple households of the total differ by no more than one-tenth of a percentage point among the definitions shown and by no more than two-tenths of a percentage point for any other family type. The distributions representing simple unweighted totals of full-year and part-year households and also the distributions for full-year households show somewhat greater differences, but are still very similar, while the distributions for part-year households are strikingly different. (The ISDP results reported in Citro and Watts (1985) show essentially the same patterns.)

To gain some understanding of what lies behind these results, we next look more closely at the kinds of changes experienced in our sample and the extent to which these changes are recognized by each definition. We see from table 1 that, in net terms, the distributions by family type changed

very little from the beginning to the end of the 12-month period of observation for either the weighted or unweighted figures.

Looking at the gross composition change experienced by original households in our SIPP sample reveals activity that the net change figures obscure. Over 17 percent of original households experienced some kind of a change in composition within the 12-month span (see table 4--the corresponding figure for the ISDP subsample analyzed by Citro and Watts was 15.5 percent). Comparing the changes in family type recognized under definition (3) with the additional changes in size recognized under definition (4), we find that somewhat more changes altered only the household size--57 percent of original households that proved unstable during the year changed size but retained the same type (1,812 out of 3,156). Some of these households experienced multiple size changes. The remaining 43 percent of unstable households changed type, and almost all of these households changed size as well. (A smaller percentage of households--28 percent--changed type in the ISDP subsample compared with the SIPP. The former data set underrepresented cases of family type change for a number of reasons including the decision to discard all households missing one or more waves of data.)

Single-parent original family households in the SIPP were most likely, overall, to experience a change in size or type (close to 28 percent), followed by original male head nonfamily households (25 percent). Married-couple households and female head nonfamily households were least likely to experience change (14.5 and 13.0 percent, respectively). Of the original married-couple households that proved unstable, the vast majority (74 percent) experienced only a change in size as opposed to a change in type, while the reverse was true for unstable nonfamily households.

Comparing the changes recognized by definition (5) with the additional changes recognized by definition (4) gives similar results for some but not all family types. The largest differences involve nonfamily households where substantially larger proportions experienced changes recognized by definition (5) compared with the additional changes recognized by definition (4) than was true for the comparison of definitions (3) and (4). This result stems from the rule in definition (5) that recognized household dissolution and formation in cases of change from single-person to multiple-person nonfamily households (and vice versa), whereas definition (3) treated these households as continuous.

We did not analyze the full matrix of changes in family type and size experienced by our unstable households, such as the proportions gaining versus losing members, etc. However, the analysis by Citro and Watts (1985) of an ISDP subsample found that composition changes were largely offsetting. For example, 26 percent of unstable households represented married couples who acquired new members, largely through birth, while 23 percent were married couples who lost members, chiefly adult children who set out on their own. Of these "emancipated" adult children, about half set up a married-couple household and the other half a nonfamily household. In terms of changes involving family type, 9 percent of unstable households represented single-parent family and nonfamily householders who got married, while 11 percent were married couples who experienced a splitup or loss of a spouse. Similarly, 4 percent represented nonfamily householders who had relatives move in, while 3 percent were single-parent family householders who had all their relatives move out.

Given these findings on gross intra-year composition changes, it is not surprising that the time-weighted and simple total distributions of family type were so much alike among definitions for the ISDP sample. The assumption that the SIPP sample similarly experienced largely offsetting changes, with about equal proportions of unstable households adding as losing members, experiencing a marital split as a marriage, etc., would account for the results shown in table 3.

But, although choice of definition does not affect the distribution of longitudinal households by initial family type, there remains the question of the extent to which different definitions obscure an understanding of the intra-year household composition changes experienced by each type of household. We evaluated the extent to which three definitions obscured changes in family type, because such changes reflect fundamental shifts in household and family structure, and because these are categories used in many analyses of cross-sectional data. More specifically, we evaluated a retrospective definition categorizing households by type in month 12; a restrictive longitudinal definition, specifically definition (1) that recognizes change only when the reference person changes; and the Census Bureau definition (5) that recognizes most but not all family type changes.

It turns out that a retrospective definition would erroneously represent 9.3 percent of the households that existed in month 12 (including full-year and newly formed households) as having had the same family type for the entire year (see table 5). The percentages misrepresented as stable range from a low of 2.9 percent for married-couple households to a high of 19.8 percent for nonfamily households headed by men. Presumably the current CPS definition which constructs household type distributions for various annual measures based on March of the following year would yet further misrepresent

household stability because of the additional time available in the period from January to March during which changes in household composition could occur. Our restrictive longitudinal definition (1) performs better than the retrospective definition on average and for all family type categories (forgoing the use of time weights to simplify the determinations). This definition would erroneously represent 3.2 percent of longitudinal households categorized by their initial family type as having had the same type for the period of their existence, with percentages varying from a low of 1.7 percent for married-couple households to a high of 11.4 percent for single-parent families headed by men. The census longitudinal definition (5) would misrepresent the family type stability of very few households--less than 1 percent overall and less than 2 percent for any individual family type category. (Tables 5a and 5b provide a detailed picture of the family type categorization for full-year and part-year households under definitions (1) and (5) comparing the first and last months of existence.) Finally, it should be noted that definition (3) represents changes in family type without error, since it uses family type as the sole criterion for recognizing a household change.

Implications of Alternative Definitions for Annual Measures of Household Economic Status

We now turn to the question of whether different longitudinal household concepts have an effect on annual low-income measures, based on determining low-income status for the period of each household's existence as the sum of monthly incomes divided by the sum of monthly low-income thresholds. Our results show that choice of longitudinal household definition has virtually no effect on an annual low-income rate calculated in the manner just

described. Using the count of time-weighted households as the base, the percentage low-income is virtually identical for all four definitions (see table 6)--ranging from 11.7 percent for definition (1) to 11.9 percent for definition (4). (These percentages are not comparable to CPS poverty rates, given that they are based on unweighted SIPP data and developed using a different procedure.)

The low-income rates for full-year households considered separately are also very similar across the four definitions and very similar to the time-weighted total rates. It is uniformly the case that part-year households exhibit higher low-income rates than do full-year households. But this difference is least for the definition that generated the largest number of part-year households (definition 4), so that the application of time-weights for all four definitions produces virtually identical low-income rates.

Categorizing longitudinal households by initial family type, the annual low-income rates for each category are remarkably similar across the four definitions based on time-weighted household counts (see table 6). The rates for the largest category--married couple households--differ by only two-tenths of a percentage point and the rates for the other family types differ by no more than six-tenths of a percentage point in the case of male head nonfamily households.

The results obtained by Citro (1985) based on an ISDP subsample are similar to the SIPP results reported here in that annual low-income rates were virtually identical for the time-weighted counts of households across definitions and very similar for full-year households. The time-weighted rates were also very similar for the major family type categories across definitions. (Across-the-board, the low-income rates obtained in the ISDP

were much higher than the SIPP rates, because of lack of imputation for missing income data and the oversampling of low-income households in the ISDP.) The ISDP subsample data, in contrast to the SIPP, showed low-income rates for part-year households that were uniformly lower than the rates for full-year households. Underrepresentation of part-year households that experienced changes in family type as opposed to size in the ISDP subsample may well account for this result.

Again, we need to look at the kinds of intra-year economic changes experienced by our households to understand the results obtained on an annual basis. Just as research with the PSID and other surveys has documented that households experience economic ups and downs that swing them above and below poverty on an annual basis, SIPP (and ISDP) data indicate that households experience intra-year changes in their economic fortunes. The group of original households in our SIPP sample that remained stable and also those that changed composition during the year included cases with sufficient variation in income to affect their poverty status.

Looking at household income to needs ratios on a monthly basis, 7 percent of stable households were always low-income, 76 percent were never low-income, and the remaining 17 percent had a combination of low-income and non-low-income months within the 12-month span (see table 7). Unstable households that only changed size showed similar patterns. Unstable households that changed type compared with other original households included a similar proportion--7 percent--that were always low-income, but a much lower proportion--66 percent--never low-income, and a much higher proportion--close to 27 percent--with some low-income and some non-low-income months. Households newly formed during the year, including offshoots formed by emancipated children and other persons leaving original households

and those households formed as the consequence of a change in family type or size, showed the highest proportion always low-income--over 14 percent--and the lowest with a mixed experience--under 10 percent.

Another way of looking at intra-year poverty experience is to ask what proportions of households classified as low-income and non-low-income over the duration of their existence were so classified every month. The data show that non-low-income households were much less likely to have low-income months than low-income households were likely to have non-low-income months. The proportions of non-low-income households that were above the low-income threshold each month range from a high of 93 percent of newly formed non-low-income households to a low of 82 percent of non-low-income households that changed family type. In contrast, the proportions of low-income households that were below the low-income threshold each month range from a high of 80 percent for newly formed low-income households to a low of 37 percent for low-income households that changed family type (see table 7).

An important question concerns the relationship, noted in the literature on the annual dynamics of poverty, between intra-year household composition change and economic change. We were not able to examine this issue directly with our SIPP data. Analysis of the ISDP subsample (Citro and Watts 1985) found that 17 percent of unstable original households changed low-income status looking at their members before and after a change in composition. The changes went in both directions; about 60 percent of the unstable ISDP households that also changed economic status went from low-income before the household composition change to non-low-income afterwards, while the other close to 40 percent went in the reverse direction. There were classic cases in the sample of the partner involved in a marital split who kept the children and fell below the low-income threshold, but also cases of persons

who married and moved above the threshold. However, the households that experienced both composition and economic change represented only 2.6 percent of the total number of original households in the ISDP sample. Moreover, there was not a pronounced difference in measurement of low-income status for these households across the various definitions. Thus, under definitions (3) and (4), those households that had both a composition and an economic change each contributed roughly one-half to the count of low-income households and one-half to the count of non-low-income households. Under definitions (1) and (2), it turned out that about half of these households were determined to be low-income over the entire span of their existence ignoring the composition change and about half were determined not to be low-income, giving virtually the same result.

Based on these findings, the negligible effect of choice of definition on annual longitudinal household low-income rates reported in Citro and Watts (1985) is not surprising. Moreover, it appears that choice of definition does not importantly obscure intra-year income changes. Thus, calculations with the ISDP subsample indicated that definition (1), based on continuity of the reference person, would erroneously represent only 0.4 percent of longitudinal households as having maintained both the same family type and the same low-income status for the period of their existence.

We cannot be sure that the patterns of association of household composition and economic status change observed in the ISDP hold for our SIPP sample, particularly as we observe that part-year households in the SIPP exhibit higher low-income rates relative to full-year households, whereas the reverse was true for the ISDP. Nevertheless, it seems warranted to assume that the number of households in the SIPP that moved above or below the low-income threshold comparing the members' incomes before and

after a composition change represent a small percentage of the total and that there was not a pronounced measurement difference with regard to low-income status for these households among the various definitions. If true, these assumptions would account for the results in table 6 that definitions recognizing more part-year households exhibit virtually identical annual low-income rates on a time-weighted basis as definitions emphasizing household continuity.

CONCLUDING OBSERVATIONS

Further analysis of our SIPP data files would be very useful, for example, to incorporate universe weights and to examine patterns of change in greater detail. Nevertheless, we are in a position to make a number of observations regarding intra-year changes in socioeconomic status among the households in our 1984 SIPP Panel sample and the implications for annual longitudinal household statistics. The data clearly indicate that a sizeable proportion of our original households--over 17 percent--experienced a composition change during the 12-month period of observation, although over half of those changes affected only household size and not family type. The data also show that high proportions of both stable and unstable original households--17 to 20 percent--experienced variations in low-income status from month to month. Overall, these findings suggest that the ongoing SIPP survey will generate a wealth of data for measurement and analysis of important kinds of intra-year social and economic change among the population.

With regard to annual statistics from our sample based on longitudinal households, our results indicate that the choice of definition does not affect annual measures of low-income status or of households by type,

particularly using time-weighted distributions. Hence, the Census Bureau may now turn its attention to other considerations, such as ease of implementation, in choosing a longitudinal household definition.

We would also suggest devoting attention to the consequences of alternative definitions for analysis of change, since definitions that emphasize continuity do overstate the extent of intra-year household stability. Thus, definition (1) would misrepresent over 3 percent of longitudinal households as having remained the same type, while a retrospective definition based on family type in month 12 would misrepresent over 9 percent of households as stable in type throughout the year. If a definition adopted by the Census Bureau were one that emphasized continuity, it would seem important that tabulations routinely classify "full-year" households into stable and unstable categories. Obscuring changes in low-income status associated with changes in composition appears to be much less of a problem based on the ISDP analysis by Citro and Watts (1985). The issue that remains problematic with regard to measurement of economic status for longitudinal households is, as we noted earlier, the meaning of "low-income" or "poverty" status for part-year households. The current definition of poverty sets an annual need standard. It is mechanically easy to translate this standard into monthly equivalents and, for full-year households, the use of an annual threshold that is the sum of monthly thresholds based on the household's actual type and size each month is arguably an improvement over the current measurement procedure. However, there is a real question that needs to be addressed as to the meaning of low-income or poverty status computed over periods shorter than a year.

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TABLE 1. Households by Type, 1984 SIPP Panel, Weighted and Unweighted

	3rd Quarter 1983--SIPP (Weighted)	3rd Quarter 1984--SIPP (Weighted)	Month 1 SIPP File (Unweighted)	Month 12 SIPP File (Unweighted)
Total households	83,081,000	84,609,000	18,323	18,709
<u>Family Type</u>				
Married-couple	58.6%	58.2%	59.5%	57.7%
Male head family	2.7	2.5	2.4	2.3
Female head family	11.5	11.5	11.6	12.5
Male head nonfamily	11.6	11.7	10.8	11.2
Female head nonfamily	15.6	16.1	15.7	16.3
Change over 12 months in number of households		+1.8%		+2.1%

SOURCE: U.S. Bureau of the Census, Economic Characteristics of Households in the United States: Third Quarter 1983 and Third Quarter 1984, Current Population Reports, Household Economic Studies, Series P-70, Nos. 1 and 5, tables 1 and 6; and tabulations of 1984 SIPP Panel 12-month extract with weights ranging from 0 to 1, referred to as "unweighted" (see text).

Note: The weighted SIPP estimates of households exclude farm households which account for about 2.2 percent of the total and represent monthly averages over the period July to September of each year. The unweighted tabulations are based on the first and last month of data in the extract file for definition (4). The data for month 1 span the period June to September of 1983 and the data for month 12 span the period May to August of 1984.

TABLE 2. Longitudinal Households Under Four Alternative Definitions by Duration, 1984 SIPP Panel, Unweighted

Definition:	1 Same Reference Person	3 Same Family Type	4 Same Household Size	5 Census Defi- nition
Total households	19,734	20,419	22,819	20,636
Ave. duration (in months)	11.3	10.9	9.7	10.8
Percent of month 1 count	107.7%	111.4%	124.5%	112.6%
Full-year households	17,558	16,975	15,167	16,877
Percent of total	89.0%	83.1%	66.5%	81.8%
Part-year households	2,176	3,444	7,652	3,759
Percent of total	11.0%	16.9%	33.5%	18.2%
Percent dissolved	34.9%	39.0%	41.2%	39.6%
Percent newly formed	56.0	50.3	46.3	49.0
Percent formed and dissolved	9.1	10.7	12.5	11.4
Ave. duration (mos.)				
Total part-year	5.2	5.2	5.2	5.1
Dissolved	7.8	7.7	7.5	7.6
Newly formed	3.9	3.8	3.9	3.8
Formed and dissolved	2.8	2.6	2.6	2.5
Time-weighted hhlds. (Household-years)	18,495	18,473	18,476	18,489

SOURCE: Tabulations of 1984 SIPP Panel 12-month extracts with weights ranging from 0 to 1, referred to as "unweighted" (see text).

Note: Dissolved households existed at month 1 but no longer existed by month 12; newly formed households did not exist at month 1 but existed by month 12; formed and dissolved households existed during the year but not in month 1 or 12. Average duration is biased slightly upwards for dissolved households and slightly downwards for newly formed households because of the assumption of stable composition in Wave I. To derive the time-weighted counts of households, full-year households have a factor of 1 applied to their weight; part-year households have a factor applied that corresponds to the proportion of the year that each existed. The differences in time-weighted counts derive from differences under the various definitions in the incidence of weights of 0.5. For example, under definition (1) the head of a nonfamily household who marries a new sample member at month 6 has a weight of 1, whereas under definition (3), (4), or (5) that household has a time-weight of 1×0.5 for the first 6 months and 0.5×0.5 for the second 6 months, for a total contribution to the time-weighted count of 0.75.

TABLE 3. Percentage Distribution of Time-weighted, Total, Full-year, and Part-year Longitudinal Households by Initial Family Type, Under Four Alternative Definitions, 1984 SIPP Panel, Unweighted

Initial Family Type Distribution	Definition:	1 Same Reference Person	3 Same family Type	4 Same Household Size	5 Census Definition
Percent of total households, time-weighted:					
Married-couple		58.8%	58.8%	58.8%	58.7%
Male head family		2.4	2.4	2.4	2.3
Female head family		12.0	11.9	11.9	12.0
Male head nonfamily		10.9	11.0	11.0	11.1
Female head nonfamily		15.9	15.9	15.9	15.9
Percent of total households, unweighted:					
Married-couple		56.1	55.0	55.5	54.0
Male head family		2.3	2.6	2.7	2.5
Female head family		13.0	13.1	13.8	12.9
Male head nonfamily		11.8	12.4	12.2	13.3
Female head nonfamily		16.7	16.8	15.7	17.3
Percent of full-year households:					
Married-couple		60.7	61.8	61.5	62.3
Male head family		2.3	2.2	2.0	2.2
Female head family		11.4	11.0	10.2	11.3
Male head nonfamily		10.2	9.9	9.9	9.3
Female head nonfamily		15.3	15.2	16.5	14.9
Percent of part-year households:					
Married-couple		19.0	21.8	43.8	16.5
Male head family		2.3	4.9	4.2	3.9
Female head family		25.4	23.8	20.8	20.0
Male head nonfamily		24.7	24.7	16.9	31.4
Female head nonfamily		28.6	24.8	14.3	28.2

SOURCE: Tabulations of 1984 SIPP Panel 12-month extracts with weights ranging from 0 to 1, referred to as "unweighted" (see text).

Note: Initial family type is the household's type during the first month of its existence. In the time-weighted tabulations, full-year households have a factor of 1 applied to their weight; part-year households have a factor applied that corresponds to the proportion of each year that each existed. The part-year tabulations do not incorporate any time weights for differing durations.

TABLE 4. Household Composition Change Experience of Original Sample Households by Original Family Type, 1984 SIPP Panel, Unweighted

Original Family Type	Stable: Unchanged	Major Change (Def. 3 or 5)	Additional Change	Total Changed
<u>Comparing defs. (3)&(4)</u>				
	<u>Def. (4)</u>	<u>Def. (3)</u>	<u>Def. (4)-(3)</u>	<u>Def. (4)</u>
No. households	15,167	1,344	1,812	3,156
<u>Percent during 12 Months</u>				
Married-couple	85.5%	3.8%	10.7%	14.5%
Male head family	69.7	15.9	14.5	30.3
Female head family	72.7	12.5	14.8	27.3
Male head nonfamily	75.4	15.7	8.9	24.6
Female head nonfamily	87.0	9.8	3.2	13.0
TOTAL	82.8	7.3	9.9	17.2
<u>Comparing defs. (5)&(4)</u>				
	<u>Def. (4)</u>	<u>Def. (5)</u>	<u>Def. (4)-(5)</u>	<u>Def. (4)</u>
No. households	15,167	1,488	1,668	3,156
<u>Percent during 12 Months</u>				
Married-couple	85.5%	3.6%	10.9%	14.5%
Male head family	69.7	14.5	15.9	30.3
Female head family	72.7	10.9	16.4	27.3
Male head nonfamily	75.4	21.8	2.9	24.6
Female head nonfamily	87.0	12.7	0.3	13.0
TOTAL	82.8	8.1	9.1	17.2

SOURCE: Tabulations of 1984 SIPP Panel 12-month extracts with weights ranging from 0 to 1, referred to as "unweighted" (see text).

Note: The "major change" category for the comparison of definitions (3) and (4) includes those original households that dissolved due to a change in family type recognized under the rules of definition (3); the "major change" category for the comparison of definitions (5) and (4) includes dissolutions recognized under the rules of definition (5); in each case, the "additional change" category includes additional dissolutions recognized under the rules of definition (4) compared with those recognized under (3) or (5).

TABLE 5. Misrepresentation of Intra-year Family Type Stability of Households, by Family Type, Under Three Alternative Definitions, 1984 SIPP Panel, Unweighted

Family Type	Definition:	Retrospective	Longitudinal	Longitudinal
		Cross-section Definition	Definition 1: Same Ref- erence Person	Definition 5: Census Definition
		Family Type in Month 12	Family Type as of First Month of Existence	
<u>Percent for Which Family Type is Misrepresented as Stable</u>				
Married-couple		2.9%	1.7%	0.4%
Male head family		16.6	11.4	1.7
Female head family		10.1	5.8	1.8
Male head nonfamily		19.8	5.4	1.4
Female head nonfamily		15.2	3.3	0.3
TOTAL		9.3	3.2	0.7
(N)		18,709	19,734	20,636

SOURCE: Tabulations of 1984 SIPP Panel 12-month extracts with weights ranging from 0 to 1, referred to as "unweighted" (see text).

Note: For the retrospective definition, the estimates shown were constructed by determining, within each family type category as of month 12, what proportion of the households had not existed in that form for the entire year (operationally, by taking 100 minus the percentage full-year households of the total of full-year plus newly formed households under definition (3) for the total and each family type category). For the longitudinal reference person definition (1), the estimates were constructed by determining, within each initial family type category (including households classified as full-year and part-year), what proportion of the households experienced a change in family type that did not result in a dissolution of the household under the rules of that definition. A similar procedure was used to construct the estimates for the longitudinal census definition (5). No time weights were used in the calculations for definitions (1) and (5).

TABLE 5a. Percentage Distribution of Full-year and Part-year Longitudinal Households by Family Type in First and Last Month of Existence, Definition 1 (Same Reference Person), 1984 SIPP Panel, Unweighted

Family Type in First Month of Existence	Family Type in Last Month of Existence					Total
	Married- Couple	Male Head Family	Female Head Family	Male Head Nonfamily	Female Head Nonfamily	
<u>Full-year households</u>						
Married-couple	98.5%	0.2%	0.2%	1.0%	0.1%	100.0%
Male head family	3.4	89.3	-	7.3	-	100.0
Female head family	2.2	-	93.5	-	4.2	99.9
Male head nonfamily	4.6	1.7	-	93.8	-	100.1
Female head nonfamily	1.3	-	2.0	-	96.7	100.0
<u>Part-year households</u>						
Married-couple	94.9	0.2	0.5	4.1	0.5	100.2
Male head family	-	84.3	-	15.7	-	100.0
Female head family	1.4	-	96.6	-	2.2	100.2
Male head nonfamily	2.0	0.4	-	97.6	-	100.0
Female head nonfamily	1.1	-	2.1	-	96.8	100.0

SOURCE: Tabulations of 1984 SIPP Panel 12-month extract for definition (1) with weights ranging from 0 to 1, referred to as "unweighted" (see text).

Note: The N for total full-year households is 19,734 and for total part-year households is 2,176. No time-weights are used for the latter.

TABLE 5b. Percentage Distribution of Full-year and Part-year Longitudinal Households by Family Type in First and Last Month of Existence, Definition 5 (Census Bureau Definition), 1984 SIPP Panel, Unweighted

Family Type in First Month of Existence	Family Type in Last Month of Existence					
	Married- Couple	Male Head Family	Female Head Family	Male Head Nonfamily	Female Head Nonfamily	Total
<u>Full-year households</u>						
Married-couple	99.7%	0.2%	0.2%	-	-	100.1%
Male head family	2.2	97.8	-	-	-	100.0
Female head family	2.2	-	97.8	-	-	100.0
Male head nonfamily	2.0	-	-	98.0%	-	100.0
Female head nonfamily	0.2	-	-	-	99.8%	100.0
<u>Part-year households</u>						
Married-couple	99.2	0.6	0.3	-	-	100.1
Male head family	0.7	99.3	-	-	-	100.0
Female head family	0.9	-	99.1	-	-	100.0
Male head nonfamily	0.7	-	-	99.3	-	100.0
Female head nonfamily	0.4	-	-	-	99.6	100.0

SOURCE: Tabulations of 1984 SIPP Panel 12-month extract for definition (5) with weights ranging from 0 to 1, referred to as "unweighted" (see text).

Note: The N for total full-year households is 16,877 and for total part-year households is 3,759. No time weights are used for the latter.

TABLE 6. Percent Low-income of Time-weighted, Total, Full-year, and Part-year Longitudinal Households, and of Time-weighted Households by Initial Family Type, Under Four Alternative Definitions, 1984 SIPP Panel, Unweighted

Percent Low-income	Definition:	1 Same Reference Person	3 Same Family Type	4 Same Household Size	5 Census Definition
Time-weighted total		11.7%	11.8%	11.9%	11.8%
Total (unweighted)		12.4	12.7	13.2	12.7
Full-year		11.1	11.1	10.9	11.2
Part-year		23.5	20.8	17.8	19.7
Time-weighted households by initial family type					
Total		11.7	11.8	11.9	11.8
Married-couple		5.5	5.5	5.7	5.5
Male head family		10.7	10.9	10.9	11.0
Female head family		30.8	31.1	31.3	30.9
Male head nonfamily		12.0	12.3	12.6	12.4
Female head nonfamily		20.2	20.5	20.7	20.7

SOURCE: Tabulations of 1984 SIPP Panel 12-month extracts with weights ranging from 0 to 1, referred to as "unweighted" (see text).

Note: In the time-weighted tabulations, full-year households have a factor of 1 applied to their weight; part-year households have a factor applied that corresponds to the proportion of the year that each existed. The part-year tabulations do not incorporate any time weights for differing durations. Low-income status is measured over the time period when each household was in existence by dividing the sum of monthly household incomes by the sum of monthly low-income thresholds for the months when the household was recognized as continuing under a particular longitudinal household definition. The low-income rates shown are not comparable with the CPS poverty rates. The bases used for the percentages exclude households with 1 or more months of missing poverty thresholds--about 2.2 percent of the total of longitudinal households under definition (1).

TABLE 7. Intra-Year Variation in Low-income Status Among Original Households by Type of Household Composition Change and Among Newly Formed Households, 1984 SIPP Panel, Unweighted

Intra-year Low-income(LI) Experience	Original Households			Total Changed (Def. 4)	Newly Formed Households (Def. 4)
	Stable: Unchanged (Def. 4)	Changed in Family Type (Def. 3)	Changed in Size Only (Def.4 - 3)		
No. households	15,167	1,344	1,812	3,156	3,542
Never LI	76.1%	66.2%	75.4%	71.5%	76.0%
Some months LI, some not LI	17.1	26.6	15.5	20.2	9.5
Always LI	6.8	7.2	9.1	8.3	14.5
TOTAL	100.0	100.0	100.0	100.0	100.0
Non LI house- holds (over their life):					
% of total	89.1	80.7	86.1	83.8	81.8
Never LI					
in any month	85.4	82.1	87.5	85.3	92.9
Some LI mos.	14.6	17.9	12.5	14.7	7.1
LI households (over their life):					
% of total	10.9	19.3	13.9	16.2	18.2
LI in					
all months	62.5	37.3	65.8	51.3	79.7
Some not LI months	37.5	62.7	34.2	48.7	20.3

SOURCE: Tabulations of 1984 SIPP Panel 12-month extracts with weights ranging from 0 to 1, referred to as "unweighted" (see text).

Note: Classification by "never low-income (LI)," "always low-income (LI)," and "some months LI, some not LI," is determined for each household for each month of its existence by comparing the monthly income to the corresponding monthly low-income threshold. "Non LI households (over their life)" are households determined not to be low-income and, conversely, "LI households (over their life)" are households determined to be low-income on the basis of comparing the sum of monthly incomes for the months of the household's existence to the sum of monthly low-income thresholds. The bases for percentages exclude households with one or more months of missing poverty thresholds. Newly formed households include offshoots formed, for example, by emancipated children leaving the parental home, plus those households formed after a change in family type or size. (In the case of households that experienced multiple changes, only the household after the last change is counted as newly formed; households that both formed and dissolved during the 12-month period of observation are excluded.)