Resource ID# 4991

The Impact of Migrant Travel Patterns on the Undercount of Hispanic Farm Workers

The Impact of Migrant Travel Patterns on the Undercount of Hispanic Farm Workers

by

Suan Gabbard, Edward Kissam, and Philip L. Martin[1]

Paper presented to:

Research Conference on Undercounted Ethnic Population
Bureau of the Census
May 6, 1993

---

[1] Co-authors are listed in alphabetical order. Dr. Susan Gabbard is Senior Research Associate at Aguirre International. Dr. Edward Kissam is Research Director of E. Kissam Associates. Dr. Phillip L. Martin is Professor of Agricultural Economics, University of California, Davis.

Introduction

About 2.5 million persons or 2 percent of all American workers are employed for wages during a typical year on U.S. farms. Information about the nation's farm workers is inadequate, but the farm workforce today appears to be undergoing a "Latinization process," as Hispanic immigrants replace White and Black U.S. citizen workers throughout the country. With immigration levels rising, and agriculture serving as an important port of entry for immigrants, there is an urgent need for reliable data on farm workers.

This paper reviews the national data on farm workers in relation to the census undercount of farmworkers and the role played by migration in the undercount: Data reviewed in this paper is from the Census of Population (COP), the Current Population Survey (CPS), and the National Agricultural Worker Survey (NAWS) as well as from recent ethnographic case studies.

Previous analyses (Whitener, 1984; Martin, 1988; Martin and Martin, 1992) have explored the definitional difficulties arising from varying concepts of "hired farmworkers", "migrant and seasonal farmworkers", and "seasonal agricultural service workers" as major factors giving rise to serious inconsistencies among standard data series on the numbers and characteristics of farmworkers.

In the current paper, we review, first, these inconsistencies, and then move on to explore the main components of the actual farmworker undercount -- i.e. problems which are not primarily definitional. To minimize the problems which stem from varying definitions of farmworkers, our analysis focuses on a specific subset of farmworkers -- "seasonal agricultural services" (SAS) workers.

This definition, codified by the Immigration Reform and Control Act of 1986 (IRCA) has the advantage of identifying a large sociological group corresponding closely to the longstanding concept of "migrant and seasonal farmworkers" There are, however, some important definitional differences. The SAS designation does not include workers engaged in off-farm processing work (many of whom are family members of fieldworkers or who, themselves, also perform fieldwork) and it does not include former farmworkers or farmworker dependents (which are included in some federal program definitions such as "migrants" or "MSFW's"). At the same time, the SAS definition does include many

skilled, supervisory, and technical workers who are better off economically than "fieldworkers"[1]

Despite its shortcomings, the concept of "SAS worker", appears to best capture the general sense of migrant and seasonal farmworkers. The "SAS worker" designation has, also, formed the basis for virtually all post-IRCA farm labor research. In particular, the definition of "farmworker" forms the basis for the ethnosurvey research in the National Agricultural Worker Survey (NAWS), the Farm Labor Supply Study (FLSS), and the eleven case studies conducted for the Commission on Agricultural Workers (CAW case studies) conducted from 1988 through 1991 which we rely on here in analyzing the components of census undercount.[2]

This paper consists of three sections:

- o a review of alternative data sources on farmworkers, a discussion of implications and recommendations for improvements
- o estimation of the cumulative undercount of farmworkers
- o analysis of four distinct components of the cumulative undercount

Three themes are developed. First, the COP and CPS miss most of the nation's farm workers, and their undercounts are most severe for Hispanic migrant workers. The 1990 COP count of 182,000 farm workers in California means that the COP recorded only about 1 in 4 of the workers employed every year on the state's farms. The CPS annual employment history questions usually found farm workers in about 1,600 of 60,000

---

[1] The definition of SAS agriculture in IRCA was linked to the concept of "perishable crops". This definition has by regulation and court decision been expanded to include most of U.S. crop agriculture. IRCA states that SAS is to be defined by commodity (perishable) and activity (fieldwork), so that SAW applicants had to be aliens who performed or supervised fieldwork in 1985-86 related to planting, cultural practices, cultivating, growing, and harvesting fruits and vegetables of every kind and "other perishable commodities." The definition of "perishable commodity" was stretched first by USDA and then by courts to include virtually all plants grown for human food (except sugar cane) and many nonedible plants, such as cotton, Christmas trees, cut flowers, and Spanish reeds. Fieldworkers include all of the paid hand- or machine-operator workers involved with these SAS commodities, the supervisors of field workers and equipment operators, mechanics who repair machinery, and pilots who spray crops.

[2] The CAW case studies generally focused on "harvest workers" since the primary research concern raised in the Congressional mandate related to peak season work. A special analysis of NAWS data for the Commission includes a comparison of the demographic and socioeconomic profile of the harvest labor force in contrast to the year-round SAS labor force. See Richard Mines, Susan Gabbard, and Ruth Samardick, "U.S. Farmworkers in the Post-IRCA Period", September, 1992 for details.

households. but the characteristics of these workers clashes sharply with the characteristics of workers interviewed at work on farms in the NAWS. Instead of the young White work force portrayed in the CPS, the NAWS finds that a typical farm worker is an Hispanic immigrant.

Second, analysis of the causes of undercount indicate that the demographic and socioeconomic profile of the farmworker population presented by 1990 census data is highly skewed since the census profiles the sub-segment of the population which is residentially settled, stably employed, most likely to speak English. The type of farmworker least likely to be included in the census profile of farmworkers consists primarily of marginal workers from two distinct and important sub-populations -- transnational male migrants, and settled female workers.

The third theme of the paper is that it will be difficult to revise the COP or CPS to obtain reliable data on Hispanic migrant workers. There are several immediate steps that could be taken to improve farm worker coverage in the COP and CPS, but other approaches may show more promise to obtain reliable farm worker data. The COP could do a better job of involving local community residents to learn where farm workers live (i.e. in mapping portions of census operations) in conducting face-to-face enumerations. The COP could also as modify its earnings and/or occupation questions to better identify farm workers, and decrease long-form respondent burden by forms redesign and greater reliance on targeted mailout of Spanish-language census forms. But the most promising way to generate farm worker data is to integrate the ethnosurvey methods pioneered in the NAWS, FLSS, and CAW case studies to generate a more accurate picture of farm workers.

Agriculture is poised to continue to serve as a port-of-entry for about 25 percent of the foreign-born workers who enter the U.S. every year—if 1 million legal and illegal immigrants enter annually, and 600,000 are in the workforce, about 150,000 can be expected to find employment on U.S. farms. Reliable data on the farm labor force will be needed to provide an empirical basis for the development of immigration policy, for planning domestic policies and programs for services to migrant and seasonal farmworkers, and for predicting medium to long-term shifts in the composition and labor market experience of the entire U.S. labor force

I. A review of Definitional Issues and Alternative Data Sources on Farmworkers

Agriculture in the U.S.

Agriculture is considered to be the oldest and largest industry in the United States (Figure 1). However, farming accounts for only 2 percent of U.S. jobs, and less than 2 percent of GDP.

Figure 1 Farming and Farm Employment
A farm is "any place from which $1,000 or more of agricultural products were produced and sold or normally would have been sold during the census year," the years ending in 2 and 7. According to this definition, there were 2.1 million farms in 1991. About 20 percent of all farms are in Texas, Missouri, and Iowa.
The largest 107,000 farms each sold farm products worth $250,000 or more, and they accounted for 56 percent of the gross cash income of farms. The smallest 1.3 million farms each sold farm products worth $20,000 or less, and they accounted for 5 percent of gross cash income. These small farms lost $500 million farming.
In 1990, exports from labor-intensive sectors of U.S. agriculture included $3 billion worth of fruits and nuts (both fresh and processed), and $2 billion worth of vegetables (fresh and processed), up sharply from 1986 levels of $2 billion and $1 billion, respectively.
About 4.6 million people lived on farms in 1990. However, most of the 2.5 million farm residents who are in the labor force are not employed in agriculture: 52 percent are employed off the farm. Most farm workers also live in towns and cities; although data are inadequate, it is believed that fewer than 10 percent of U.S. farm workers live on farms.
The U.S. Department of Agriculture and many farm organizations argue that farming is far more important to the U.S. economy than employment and sales data would indicate. Employment on farms averaged 2.5 million in 1990, accounting for 2 percent of the nation's 117 million employed persons. Another 5.4 million workers were employed in industries that provide inputs to farmers – almost 3/4 to provide them with services such as banking, research, and insurance. A further 13.2 million were employed to manufacture and distribute food products, including 10 million in food retailing and restaurants.

Defining Agriculture as an Industry

Modern U.S. agriculture, particularly in the labor-intensive sector of fruit, vegetable and horticultural (FVH) production of the industry which employs most migrant farmworkers includes, in addition, to traditional family farms, many very large "factories in the field". Most farms have barns, fences, and other familiar features, but many hired workers are employed on "farms" that have their headquarters in urban office buildings. There are often no familiar farm buildings in the orchards or vineyards where many migrants workers are employed, and no buildings at all in the forests where other migrant workers find jobs.

The U.S. economy is divided into different industries by the Standard Industrial Classification Manual (OMB, 1987). The SIC divides operations that engage in agricultural production into five categories: crop production (SIC 01), livestock production (02), agricultural services (07), forestry (08), and fishing, hunting, and trapping (09). Establishments are classified into one of these categories on the basis of their sales, so that a combination strawberry and Christmas tree farm, if at least 50 percent of its sales are from strawberries is classified first as a crop farm (01), then as a fruit and nut operation (017), and finally as a berry establishment (0171). In the economic censuses conducted every five years, any employment-related data provided by establishments to government agencies are included in only one SIC code, so that e.g. any Christmas tree workers and wages from the combination tree and berry farm described above are reported with strawberry crops.[3]

Farm employers are sometimes just as hard to recognize as farms. Most agricultural data assume that there is one operator per farm, and that anyone else employed on the farm is an unpaid family worker or a hired worker. While this 3-way classification describes accurately the employment situation on most U.S. farms, it is increasingly being outmoded by the growing tendency of agricultural producers to rely on agricultural service firms to supply labor and other inputs they need. This tendency is particularly notable in some regions of the country (e.g. Florida and California) and in some commodities (citrus, tomatoes) where corporate joint ventures re-structure traditional responsibilities for

[3]If tree and strawberry production activities each employ 50 or more workers, then in California and many other states, the farm should be reported as 2 establishments, a berry operation with a SIC 01 code and a tree operation with a SIC 08 code.

different production, processing, and support tasks).[4]. Such structuring of farm labor tasks also exists on traditional farms.

Defining the Occupation of Farmworker

Agricultural operations have become far more complex since the mid-1960s, when eligible farm worker meant everyone employed on farms, but there is no easy way in regularly published labor data to distinguish field workers (and among this group, migrant and seasonal farmworkers) from other employees on farms.

Surveys must determine who, among all agricultural employees, are considered to be farmworkers. For example, eligible farm workers can be defined as all persons who do qualifying work for wages, or eligibility can be restricted to employees who are not related to the farm operator.[5] Farm workers are often defined by the industry in which they work--as when all persons employed on farms are "farm workers" for FLSA purposes -- farm workers can be defined by the task they perform so that on a large FVH farm, there may be fieldworkers, equipment operators, supervisors, as well as accountants, lawyers, pesticide advisors, and other professionals. The number of such workers who are employed on farms but who perform nonfarm tasks is considerable; in California UI data, about 20 percent of the weeks of UI benefits paid by agricultural employers (SIC 01, 02, 07) are paid to persons who do not have farm worker occupations, such as mechanics or computer operators employed on large farms.[6]

---

[4] See (Emerson and Polopolus, 1993) for a discussion of restructuring of production tasks in Florida citrus and (Runsten et al, 1992) for a discussion of multi-national operations in tomato production in Florida, California, and Baja California.

[5]Nationally, up to 15 percent of total farm wages that are paid to hired workers are paid to relatives of the operator, often in order to shift farm profits into lower income tax categories. This practice seems most common on midwestern grain and livestock farms. Robert Coltrane, personal communication, June 1989.

[6]In 1992, about 3.2 million weeks of UI were paid to persons employed by agricultural reporting units, over one-eight of all weeks of UI paid in the state. However, UI payments of $338 million were just 9 percent of total UI payments, reflecting lower farm wages.

Migrant Numbers and Characteristics in Different Datsets -- Current Population Survey (CPS) Data

The monthly Current Population Survey (CPS) has the advantage of being a probability sample of all U.S. households, so that its sample results can be expanded according to a formula to report the number of various types of farm workers in different geographic regions. It is for this reason that the CPS could expand the farm workers it found in about 1,500 households during the 1980s to the estimated total 2.5 million hired farm workers. The farm workers profiled in the 1987 CPS were 78 percent White, 14 percent Hispanic, and 8 percent Black and other. White workers were the majority or plurality in every region of the United States, including the Pacific states of California, Oregon, and Washington, where white farm workers outnumbered Hispanics 54 to 44 percent.

Researchers and migrant service providers frequently observe that the CPS generates the "wrong" ethnic mix of farm workers. As evidence, they note that the CPS reports that most farm workers are employed in non-labor intensive field crop and livestock agriculture, rather than in the FVH agriculture in which most of those currently served are employed. For example, if the workers who were employed in more than one commodity in the CPS are assigned to the commodity in which they did the most days of farm work in 1987, then only 20 percent of all hired workers – 518,000 of 2.5 million – worked only or mostly or only in FVH commodities. Over 1.1 million workers, by contrast, worked mostly or only on grain and other field crop farms. Few observers believe that there are two workers employed on non-FVH farms for every worker employed on FVH farms.

In Figure 2 below we summarize the demographic and socioeconomic profile of CPS-identified farmworkers -- a profile which contrasts sharply with the profile from recent survey and ethnographic research.

Figure 2. CPS Profile of 2.5 Million Farm Workers: 1987
1. Demographic Characteristics: Most farm workers are young white men.
• 80 percent are male; 70 percent are 34 or younger (median age 26); and 2 percent are 14 to 17 years of age.
• 78 percent are white; 14 percent are Hispanic; and 8 percent are Black and other; whites are the youngest farm workers (median age 24), Hispanics (29), and Blacks oldest (30).
• 23 percent of all hired farm workers have 8 or fewer years of schooling; 50 percent had 12 or more years of education. Hispanic farm workers had the least education: 56 percent have 8 or fewer years of education, versus 35 percent of Blacks and 16 percent of whites. Among farm workers 25 and older, 26 percent had 8 or fewer years of education, including 72 percent of the older Hispanic workers.
• Midwestern Corn Belt states such as Iowa and Illinois include 19 percent of all farm workers, followed by the Pacific states of California, Oregon, and Washington, and then the Lake states of Wisconsin, Minnesota and Michigan (12 percent each).
2. Farm work and Earnings:
• Workers averaged $3,400 for 112 days of farm work in 1987, and $3,300 from doing nonfarm work, for $6,700 total earnings. Daily farm earnings of $30 suggest an average wage of $3.76 hourly for an 8 hour day.
• Hispanics had the highest average daily farm earnings ($32) and did the most days of farm work (139), so their $4,500 annual farm earnings exceeded those of whites ($3,200) and Blacks ($2,700).
• Most farm workers worked primarily in grains and field crops (45 percent), or with dairy or livestock production (34 percent). Only 21 percent worked mostly with FVH commodities. Almost 50 percent of the Hispanic farm workers worked with FVH commodities, and almost one-third of the Black farm workers worked in tobacco and cotton production.
Source: Oliveira and Cox, 1989.

The CPS portrays a young, white, and male work force. In the CPS data, whites are the youngest farm workers (median age 24), largely because so many of them are 14 to 17 year-old teenagers in the midwestern states. However, in the regions such as the Pacific and the southeastern states that produce FVH commodities, farm workers outnumber operators, and the operators tend to be white while the hired workers tend to be minorities.

Even before the passage of IRCA and recent post-IRCA research, there was evidence that the findings from analyses of CPS data were inconsistent with findings from regional surveys. For example, a 1983 University of California/EDD survey (Mines and Martin, 1986) reported that California farmworkers were 87% Latino at a time that the

Hired Farm Workforce reported that Pacific Region farm workers were 44% Latino (Oliveira and Cox, 1989). In another example of data divergence, the Hired Farm Workforce reported that only 14% of the national crop labor force worked in the Pacific Region while the Census of Agriculture (COA) reported that 40% of all crop labor hours were performed in the Pacific Region (Martin and Martin, 1992).

National Agricultural Worker Survey (NAWS) Data

The National Agricultural Worker Survey is a national survey of seasonal agricultural services workers with the sample stratified proportionate to size. The NAWS profiles a different farm work force than the CPS.. Instead of finding mostly white farm workers, the NAWS finds that three-fourths of all farm workers in Seasonal Agricultural Services (SAS) or U.S. crop agriculture are minorities, usually Mexican nationals who have been in the United States for less than 10 years The NAWS found that most of these farm workers are married men who are poorly educated and who live with their families at their U.S. work sites.

In surveys conducted between 1989 and 1991, the NAWS found that 40 percent of SAS farm workers were U.S.-born and 60 percent were foreign-born. The foreign-born included Special Agricultural Workers (SAWs)-- 40 percent had "temporary resident" status; another 25 percent were (greencard) permanent resident aliens; 16 percent received legal status through other programs, such as political asylum; and about 20 percent of the alien workers were unauthorized mostly post-IRCA arrivals. About 60 percent of the estimated 200,000 unauthorized workers arrived within the past five years, i.e., after IRCA was enacted.[7]

The average Seasonal Agricultural Services (SAS) worker did farm work for 1.7 farm employers. Most workers were employed for about half of the year at hourly wages that were 14 percent above the federal minimum of $4.25 hourly. NAWS workers averaged $4.85 for 37 hours of work per week while they were doing farm work. Their

[7]There are many estimates of the percentage of U.S. farm workers who are unauthorized. In hearings and case studies conducted by or for the Commission on Agricultural Workers (CAW) in 1990 and 1991, it was estimated that 10 to 40 percent of the workers were unauthorized. However, these estimates often refer only to harvest workers, who in the NAWS were only 42 percent of all workers(coincidentally, the percentage of harvest workers is equal to the number of migrant workers in the NAWS). Virtually all harvest workers were foreign-born, so if 40 percent of all harvest workers were unauthorized, and 20 percent of the remaining foreign-born workers(one-third of the remaining 18 percent of all SAS workers) were unauthorized, then the NAWS is suggesting that less than one-fourth of all SAS workers are unauthorized-- 17 plus 6 percent.

average weekly earnings of $180 for 26 weeks of SAS work generated annual farm earnings of $4,665, about three-fourths of the $6,465 poverty-level income for an individual in 1990. SAS farm workers average another 10 weeks of unemployment searching for farm and nonfarm jobs.

The NAWS found that most Seasonal Agricultural Services (SAS) workers were employed in FVH commodities—90 percent worked in these commodities. Vegetable farms employed 43 percent of the sample workers sometime during the year; fruit and nut farms 32 percent; and nursery and horticultural specialty operations 15 percent. This distribution of workers across commodities differs significantly from the distribution of labor expenditures in the Census of Agriculture. In the Census of Agriculture (COA), almost 40 percent of all crop labor expenditures were made by non-FVH farms and, in a further example, vegetable farms accounted for just 24 percent of COA labor expenditures, while the NAWS reported that 43 percent of the workers interviewed were employed by vegetable farms. [8]

Over one-third of the farm workers in the NAWS also did non farm work. Even though it paid slightly less per hour than farm work, nonfarm work was preferred by most workers interviewed while doing farm work, suggesting that layoffs or a lack of nonfarm jobs pushed these workers into farm work, not that they were not attracted to farm work by its higher wages. Nonfarm work in services such as janitorial or clean-up businesses or in construction was reported by many farm workers to be more stable and to offer them more opportunities for upward mobility.

Many farm workers spend part of each year abroad; the average SAS worker spent 8 weeks abroad during the year. It has been argued that most workers from Mexico are small farmers who come north when drought or pests wipe out their crops. NAWS data, as well as the extensive literature on Mexico-US migration seem to belie this notion that Mexican farm workers in the United States use the U.S. farm labor market as a safety

---

[8]All crop farms – field crop and FVH – reported $8.2 billion in total labor expenditures in 1987. IN the COA, 38 percent of labor expenditures were made by field crop farms, even though the NAWS found that only 7 to 10 percent of the interviewed workers were employed on the field crop farms. Many of the hired workers on field crop farms whose labor costs are reported to the COA may be artificial in the sense that, if the farm family has a good year, the older children are paid wages to shift net farm income into lower income tax brackets. This shifting of farm income into lower tax brackets may also occur in the CPS, and it helps to explain why farm workers in that survey are distributed in that survey in a fashion similar to family farms. Unemployment insurance or other payroll taxes are typically not paid on these wages.

valve; according to the NAWS, even the workers who returned to Mexico for longer periods did not earn much money there.[9] Instead, most of the time abroad is devoted to vacation and visiting relatives.

Nationally, foreign-born workers were 60 percent of the crop workers in the early 1990s, and an even larger share of the new entrants in to the agricultural work force. By some estimates, 90 percent or more of the persons who have been doing farm work for less than 3 years were born abroad, and many of the U.S. citizens among those who have just entered the farm work force have foreign-born farm worker parents.

NAWS data are probably the most reliable demographic data available on 80-90 percent or about 2.2 million of the nation's estimated 2.5 million hired farm workers, but they have several limitations. First, the NAWS can be reported only as percentages within the sample. This means that the NAWS finding that 92 percent of the crop workers interviewed in California are foreign-born Hispanics cannot be translated into the statewide total of foreign-born and U.S.-born workers because the NAWS does not know how many farm workers there are in the state.

In FY '93, the NAWS was recognized to be an extremely useful vehicle for generating demographic data on farmworkers for several different federal programs (Migrant Health, EPA, Migrant Education, Migrant Legal Services) and the survey instrument was expanded to meet some of the data needs of these agencies. But the scope of the NAWS has not yet expanded to provide the "ideal" multi-user survey of farmworkers needed to provide a common database for multi-agency planning, although the modifications required to accomplish this are feasible and affordable. Also, there are no public use NAWS data available. What is known about farm workers from the NAWS is what the U.S. Department of Labor has made available. There is little opportunity to organize NAWS data differently, and thus it is hard at this time to compare available NAWS data to CPS, UI, and other data.

The NAWS profiles a farm work force that most researchers and service providers are familiar with, but its sample results cannot be extrapolated to estimate numbers of farm workers and dependents eligible for services to states and counties, as would be desired for program planning purposes. Furthermore, it may difficult to modify the NAWS in a

[9]The 40 percent of the NAWS sample workers who went abroad spent an average 19 weeks there in 1989.

manner that would allow the generation of such low-level geographic data. Although the NAWS has emerged as the major source of information on the demographic characteristics of farm workers, it has not yet proven to be useful to allocate limited MSFW assistance funds to state and local areas.

The NAWS California Sample

The NAWS was designed to be a national sample. For this reason, there are generally no tabulations of NAWS data for states or regions. However, 25 percent of the interviews were conducted in California, and a special report tabulation of the California NAWS data[10] suggests that the state's farm workers included in the NAWS are similar in age and marital status to farm workers throughout the United States. California has a higher percentage of immigrant workers (90 versus 60 percent), a higher percentage of SAW workers (62 versus 29 percent), and more poorly-educated workers (71 percent with 8 or fewer years, versus 53 percent). As in the national NAWS data, California crop workers are mostly young men who are married and have children, but about one-third of them do not have their children with them when they are doing farm work in the state.

California workers did one-fourth more weeks of SAS work than did similar workers throughout the United States. While doing such work, they had 12 percent higher hourly earnings (median $5.41 versus $4.85) but, because they worked more hours per week (41 versus 37) and more weeks per year(33 versus 26), they had 57 percent higher SAS earnings ($7320 versus $4665). An astounding 6 of 7 worked sometime during the year in fruits and vegetables (this may also include nurseries, but it excludes livestock and dairy). Most California farm workers believed that they were covered by workers compensation (WC), UI, and health insurance, but since virtually all farm workers should be covered by WC and UI, it is surprising that one-third or more reported that they were not covered.

Almost half of the NAWS workers interviewed in California had incomes below the poverty level, about the same percentage as farm workers throughout the United States. Fewer California workers have nonfarm work throughout the year (17 versus 36 percent)

---

[10] See (Mines, Gabbard, and Boccalandro, 1993a) These data are from the California NAWS interviews conducted between October 1989 and October 1991. The comparisons are not California versus rest of United States comparisons because California data are included as one-fourth of the rest of the U.S. data.

and, as elsewhere in the United States, this nonfarm work offered lower hourly earnings than farm work. In California, median nonfarm hourly earnings of $4.92 were 10 percent less than farm earnings of $5.41. California farm workers were about as likely to spend time abroad as are farm workers throughout the United States; the half who spent time abroad spent an average 4 months abroad.

The Farm Labor Supply Study

Farm Labor Supply (FLSS) data were collected in household surveys of low-income neighborhoods of three identified farmworker communities in the United States during the spring of 1990.-- Parlier, California; Weslaco, Texas, and Immokalee, Florida.[11] These communities share in common a long history as recognized farm labor supply centers while, at the same time, representing three very diferent regions of the U.S. Structural characteristics in these communities are similar to those in most farmworker "homebases". For two of the communities, Weslaco, TX and Parlier, CA, there also exist detailed ethnographies providing a historical background on the evolution of these communities (Rubel, 1966: Trujillo, 1975).

The FLSS, like the NAWS, identifies both migrant and year-round workers but, unlike the NAWS, it underrepresents peak-season workers who arrived after the survey period (January-April, 1990). However, since the FLSS survey included a detailed one-year work history, and a 5-year summary occupational profile, it successfully identified all sampled workers who worked in farmwork at any point during the year.

The FLSS data differ from the CAW case study data in including not only harvest workers but, also, workers employed in other occupations. Also because the FLSS, unlike the NAWS and the CAW research, is a household survey (not an establishment survey) it includes detailed information on farmworker households, including dependents and non-agricultural workers. The FLSS research designed, because of its ethnosurvey orientation, conducted detailed mapping of each community surveyed, including characterizations of housing accommodations, making the case studies particularly useful in relating community structural characteristics to population demographics.

---

[11] Edward Kissam and David Griffith, **The Farm Labor Supply Study: 1989-1990**, Final Report to Office of Policy, U.S. Department of Labor, Micro Methods, 1991.

The FLSS research effort also involved ethnographic case studies in three "upstream" farm labor markets linked to the ethnosurvey communities. Two of these upstream labor markets are in the Eastern migrant stream -- New Jersey, Delmarva Peninsula, and one is in the Midwest -- Southwest Michigan.

The Commission on Agricultural Worker Case Studies

These are case studies of the farm labor force in distinct crops and regions of the United States conducted during 1990-1991.[12] The eleven studies were designed to provide insight into the broadest geographic and commodity range possible with limited funding. Study locations were chosen to represent "major" crops in each study region. Case study areas and crops include: Florida winter vegetables, South Texas winter vegetables, Central California citrus and raisins, Arizona citrus, California tomato production in San Diego, Fresno, and San Joaquin counties, Oregon fruit, vegetable, and Christmas tree workers; New York and Pennsylvania apple workers, Georgia and South Carolina peach workers, Central Washington apple and asparagus workers, and Southwest Michigan apple, pickle cucumber, and multi-crop small farm workers.

The CAW case studies, like the FLSS cannot be used to make generalizations about the farm labor force at the state or regional level, but study locations were chosen to assure that case studies represented to the maximum extent possible "paradigm cases" of labor-intensive agricultural labor markets, not idiosyncratic conditions. However, it should be observed that the CAW case study labor markets represent areas known to rely on immigrant workers and, thus, may differ from labor markets which rely less extensively on this labor pool.

In this paper, it has only been possible to analyze data from three of the eleven CAW case studies -- Central Washington, Michigan, and California tomatoes. Similar analyses are presumably possible for most other CAW datasets.

---

[12]Commission on Agricultural Workers, Report of the Commission on Agricultural Workers, November, 1992.

The CSMR Alternative Enumeration Studies

The Center for Survey Methods Research in the Bureau of the Census has sponsored a range of ethnographic studies designed to provide a broad panorama of factors involved in undercount among different hard-to-count populations based on a common research methodology (Brownrigg and Martin, 1989). The alternative enumeration study series includes two case studies designed to address farmworker undercount issues -- one in Woodburn, OR (Montoya, 1993), the other in Guadalupe, CA (Garcia, 1992). Other studies in immigrant-receiving areas provide important insights into the mechanisms of undercount which have implications for the issue of farmworker undercount.

The utility of the alternative enumeration studies is limited by the fact that the Guadalupe, CA neighborhood is quite atypical among farmworker communities, in California and in the nation. In contrast, the Woodburn, OR case study neighborhood is closer to prevailing conditions.

Other Recent Ethnographic and Ethnosurvey Research on the Current Farm Labor Force

California's Employment Development Department has sponsored a number of studies of the post-IRCA farm labor force. These include several crop-specific studies --of the nursery industry, of table and raisin grapes -- and a variety of "special topic" studies -- of farmworkers' occupational mobility (Gabbard and Goldring, 1992), of farm labor contractors (Runsten et al, 1993), and selected community studies -- in McFarland, Guadalupe, Arvin, and other areas (Palerm et al, 1990).

The Center for Immigration Studies also sponsored a multi-site ethnographic study of selected crop/regions in the post-IRCA period (Heppel and Amendola, 1990). The study areas are similar to those of the CAW but include some more idiosyncratic crop regions (e.g. Pennsylvania mushrooms).

There have also been several ethnographic and ethnosurvey-based research projects examining an important ethnic sub-group among California farmworkers (Bade, 1990; Zabin et al., 1993).

The National Science Foundation is also sponsoring an ongoing study of immigrant adjustment and inter-ethnic relations in South Florida which has allowed David Griffith and Ed Kissam to expand on the observations of the FLSS and CAW studies regarding South Florida.

Overview -- Consistency between the Ethnographic Case Studies and the NAWS

The utility of the many ethnographic studies during the period between 1989 and 1991 in addressing the general issue of undercount is that they 1) provide valuable information on community differences and the extent of heterogeneity among farmworkers as well as 2) provide some opportunities to assess the validity the state and national level data.

While the post-IRCA ethnographic case studies show great variation from location to location, the picture which emerges from all is remarkably consistent with the national and state level profile of farmworkers from the NAWS. This picture is one of a primarily Mexican-born farm labor force which, however, includes significant numbers of other foreign-born workers (primarily Guatemalans), significant numbers of U.S.-born children of immigrant farmworkers, and a significant number of transnational migrants.

Migration and the Farmworker Undercount

Both current migration patterns and migration history are important factors in understanding farmworker undercount since the farm labor force actually consists of several successive immigrant worker cohorts These cohorts include 1965-1975 post-Bracero "green card" families, 1975-1985 arrivals from the height of Mexico's economic and Central America's political crises, and post-IRCA arrival 1986-present) with an increasing proportion of indigenous populations. Current cross-sectional views of the post-IRCA labor force in 1990 confirm the importance of migration in assessing the farmworker census undercount, but even more globally, in determining the composition of the farm labor force in 1990, the prevailing system of social and economic relationships, residence patterns and housing accommodations, and occupational strategies -- all elements which make farmworkers an extremely hard-to-count population.

A migratory lifestyle is, indeed, closely related to the undercount of U.S. farmworkers -- not simply because farmworkers are "on the road" on the April 1 census day but, also, from the reality that the overwhelming majority of the U.S. farm labor force is a "transnational population" -- a labor force dominated by immigrants (most of them Mexican), their children (most of them American), and, also, a large number of back-and-forth migrants spending much of their lives in the U.S. but returning regularly to Mexico or Central America. About one in three U.S. farmworkers spends at least one month of each year abroad. NAWS data show that migrant farmworkers make up 66% of U.S. harvest labor force -- 42% of the overall farm labor force. Of these migrant workers, 75% are transnational migrants and, indeed, this is one of the highest undercount groups among U.S. farmworkers -- but more as an indirect result of a whole complex of lifestyle adaptions to transnational migration than directly because of "being on the road".[13] In many respects, the social and linguistic distance which separates America's farmworkers from the mainstream population plays a greater role than migration through physical space in making it difficult to count farmworkers. The conceptual metaphor of not finding farmworkers because they are "on the road" is, in reality, an accurate metaphor when understood in terms of social invisibility -- due to linguistic and cultural isolation, due to living in crowded housing accommodations only poorly captured by the street address grid which defines "official" America.

II. Assessing the Cumulative Undercount of Farmworkers

In this section we, first, assess the extent of the "cumulative undercount" of U.S. farmworkers and, second, explore the contribution made by different factors to the overall undercount. This analysis of the distinct "components" of undercount, in turn provides insight into the causes and analytic consequences of farmworker undercount.

We adopt a meta-analytic strategy for estimating and characterizing the undercount of U.S. farmworkers. Such a meta-analysis rests squarely on the recognition in the past decade that research methodologies borrowing both from ethnography and from survey research have tremendous utility in characterizing minority populations. Quite specifically, our ability to analyze the quality of current data on farmworkers stems in large measure

[13] For a detailed discussion see Susan Gabbard and Richard Mines, "A New Understanding of Farmworker Demographics: Contrasting pre-IRCA and post-IRCA Images of Field Workers", paper presented to WRCC-76 Committee, USDA, March, 1993.

from various federal and state agencies' new post-IRCA initiatives in farm labor research described in the previous section.

Three lines of research sponsored by the Bureau of the Census (both relying on structured ethnosurvey and ethnographic research methodology) have contributed tremendously to our current ability to assess the farmworker undercount in the 1990 census. The first of these efforts is that of extensive research associated with the 1986 Los Angeles test census which generated high-quality data on undercount issues via the Causes of Undercount Survey. The second of these efforts is CSMR's sponsorship of the Alternative Enumeration studies. Because the Causes of Undercount Survey generated extensive data on a Hispanic (primarily Mexican and Salvadoran) population with strong ongoing migration flows it has immediate relevance to the issue of farmworker undercount. Because the Alternative Enumeration effort was designed to provide the best possible coverage of a wide range of populations and communities, the coordinated effort also has immediate relevance.[14] Finally, CSMR's sponsorship of research on factors affecting Hispanics' responses to the census long form (Farr and Olivares, 1991; Kissam, Nakamoto, and Herrera, 1993) provides additional insight into the interactions between the census social system and the social system of Hispanic immigrants.

In terms of assessing the adequacy of the 1990 census data on farmworkers, it is extremely serendipitous that the Department of Labor and the Commission on Agricultural Workers studies were also designed to have a common core data set This means that although research was conducted by different researchers and in a number of different areas of the country, key data (detailed annual employment history, family composition, migration history, demographic and socioeconomic profiles) are available in each of the datasets.[15].

---

[14] Like the Department of Labor and Commission on Agricultural Workers research effort, the value of this research effort was maximized by being unified in a well-designed, coordinated program. See (Brownrigg, 1988) for a description of the overall design.

[15] The research design for the National Agricultural Workers Survey (NAWS), the Farm Labor Supply Study (FLSS), and the Commission on Agricultural Worker case studies (CAW) were all developed by Richard Mines of the Department of Labor, based on his own previous research on Mexico-US migration and the work of researchers such as Cornelius, Massey, and their colleagues.

The Bottom Line: the Cumulative Undercount of Farmworkers

In this section, we analyze the cumulative undercount of farmworkers for California. There are several reasons for this choice. First of all, California leads the nation in labor-intensive agricultural production, accounting for about one-quarter of total farm labor expenses (Oliveira,1991) and almost one-third of total fruit, vegetable, and horticultural (FVH) production. Secondly, because of the importance of agriculture in the state there is a broader range of research data for assessing the adequacy of the 1990 census data on farmworkers. Finally, a focus on California provides the broadest base for comparing census and ethnographic data on farmworkers, although we also analyze in this paper data from other regions of the U.S.[16] Parallel analyses of the top farm labor states in the U.S. would provide an aggregate total estimate of farmworker undercount.

What is the absolute extent of the census undercount of farmworkers in California ? In the following section, we evaluate the 1990 census count of California farmworkers with data from two leading alternative data sources – UI data files and the 1987 Census of Agriculture. Table 1 below provides three alternative estimates of the California farmworker population and compares them to the 1990 census count of California farmworkers.[17]

---

[16] Much farm labor research over the past thirty years has observed how different the California farm labor force was from the labor force of the rest of the nation. While it is important still to stress the heterogeneity of the U.S. farm labor force, a consensus has emerged that during the 1980's the entire U.S. farm labor force became heavily "Latinized" (Mines, Gabbard, and Samardick, 1990; Griffith and Kissam, 1991; CAW, 1993). Historically, the transformation of the composition of the farm labor force is easiest to trace in Florida and the Eastern migrant stream as the ethnic composition has shifted more recently than in California which has relied on a largely Mexican labor force for many years.

[17] Analysis of California data is particularly useful as the quality of available data is better than for other states and there exist more alternative data sources than for other states. Other potentially useful sources of data for cross-checking estimates of the California farmworker population include Workers' Compensation data (Villarejo, 1988).

Table 1
Alternative Estimates of California Farmworker Population

Alternative Estimates: California Farm Labor Force	Total Farmworkers (SAS workers)	1990 Census Count as % of Actual Farmworker Population
1. 1990 Census of Population	182,235	---
2. Agricultural Employment and Earnings estimate adjusted by NAWS data on hours and weeks worked	563,000	32%
3.1990 Unemployment Insurance data	630,000 - 720,000	25-29%
4. 1987 hired agricultural workers estimated on the basis of total labor expenses, earnings, and hours worked	630,000	29%

Table Notes

1. 1990 Census of Population data is an extract of the California PUMS 5% sample. The extract consists of all workers in occupational codes 477 (farmworker), 479 (farm supervisors), and 484 (horticultural workers). To maximize comparability with post-IRCA research definitions of farmworkers as "seasonal agricultural services" (SAS) workers, the dataset is further screened to eliminate livestock workers and other miscellaneous misclassifications (e.g. retail florist industry employees), former farmworkers (those who had not worked in farmworker since 1988 or earlier), and those with earnings over $50,000 (approximately $24 per hour).

2. The estimate of "full-time equivalent" farmworkers is based on average monthly employment (California Agricultural Employment and Earnings Bulletin, EDD, 1991) which is then multiplied by the NAWS data on hours worked per year by SAS workers to convert FTE to an estimate of total farmworkers. (Richard Mines, Susan Gabbard, and Bea Boccalandro, "California Report: NAWS", Office of Policy, U.S. Department of Labor, [forthcoming, 1993). The California NAWS data show SAS workers to work 33 weeks per year on the average, amounting to 1.58 farmworkers per "full-time equivalent".

3. Unemployment insurance (UI) data include all agricultural SIC codes and shows approximately 900,000 California workers employed in an agricultural SIC code. The UI total is adjusted downwards by 20-30% to reflect our best estimate of non-production workers in the UI database (e.g. managers, clerical workers, sales persons), problems with workers using multiple social security numbers (offset by multiple workers using a single social security number, and livestock workers (to preserve comparability with SAS workers).

5. Total California labor expenses are from Victor J. Oliveira, "Hired and Contract Labor in U.S. Agriculture, 1987: A Regional Assessment of Structure", Agricultural Economics Report, USDA, 1991. Data on hours worked per year are from Richard Mines, Susan Gabbard, and Beatriz Boccalandro, "Findings from the National Agricultural Workers' Survey (NAWS) 1990, Office of Program Economics Research Report #1, U.S. Department of Labor, 1991. Data on 1987 hourly earnings are from tabulations of USDA Farm Labor Survey data prepared by Greg Miller for the Commission on Agricultural Workers.

Discussion of the Analysis and Possible Sources of Error in Alternative Non-Census Estimates of the Farmworker Population

Our Table 1 estimate of the extent of California farmworker undercount is a conservative one. While there are important definitional problems, sampling problems, and reporting problems which affect the reliability of virtually every source of data on farmworkers, it must be observed that the alternative data are clustered in a distribution which can be interpreted as a best estimate of about 620,000 farmworkers. . Even given these problems, it is clear that the 1990 census count of farmworkers (SAS workers) is an outlier -- equivalent to a 71% undercount.

It is important to stress that the alternative estimates presented here reflect at least two independent data sources -- UI data on worker employment and USDA agricultural employer survey data on labor expenses -- as the major component of the analysis. While the limitations of UI data are primarily definitional (since employment records do not include enough detail to achieve full comparability), the limitations of the USDA and Agricultural Employment and Earnings Survey data are primarily sampling problems, stemming in large measure from difficulties in sampling farm labor contractors.[18] The major remaining source of uncertainty is the adequacy of data on hours worked per week and weeks worked per year which is used to convert total demand for agricultural labor into an estimate of the total farm labor force. There are problems associated with all estimates of farmworkers' hourly earnings but, in contrast, NAWS data on weeks worked per year is likely to be highly reliable.[19]

---

[18] Researchers such as Richard Mines argue that there are more Social Security numbers than there are farmworkers. However, our experience suggest instead that in the post-IRCA period there are more workers than there are social security numbers since, in some cases, multiple family workers, or even unrelated workers share a single social security number. One reason for this is that legalization under IRCA provided an amnesty for legalized workers to clear up social security records while another reason is that a single identification document is often passed around or duplicated for multiple workers.

[19] USDA estimates of hourly wage data for workers paid by piece rate is computed by dividing reported labor expenses by reported hours. There are powerful incentives for agricultural employers to under-report total hours worked (e.g. minimum wage compliance) resulting in a systematic upward bias of hourly wage data. However, even computations of hourly wages in ethnosurvey data suffers from workers' recall problems due to daily variations in hours worked. In the case of workers paid by piece rate, informants do not know their hourly earnings. Typically, raw data reported (sometimes on a employer-generated printout) are daily or weekly earnings but even these data may be ambiguous as earnings are often reported for an entire crew.

Row 1 of the estimates in Table 1 represents the 1990 Census of Population count of non-managerial SAS workers (excluding farm owners and managers but including farm supervisors).

The Row 2 estimate of numbers of California farmworkers is based on EDD data from the Agricultural Employment and Earnings monthly survey of agricultural employers in California converted from "full-time equivalent" farmworkers to actual numbers of farmworkers using 1989-1991 NAWS data on hours per week worked and weeks per year worked for the average farmworker. The leading source of error which might result in an upward bias in this estimate is that the EDD estimates include workers employed in non-farmwork occupational categories within agriculture (e.g. managers, clerical workers, etc.). The leading sources of error which might bias the EDD estimates downward are: multiple workers using a single social security number and exclusion of small labor contractors from the sampling frame. An additional source of sampling error is that EDD surveys employment for only one week of each month but it is assumed that random errors cancel out. Additional, unknown errors may result from problems of comparability between the NAWS which surveys only "seasonal agricultural services workers" and the EDD Agricultural Employment and Earnings data series.

The Row 3 estimate of California farmworkers is based on EDD UI files generated from employers' reports mandated by law. Like the EDD data of Row 2, these data include non-farmworker agricultural employees which may bias the estimate upward. However, the UI data also have sources of downward bias due to the possibility of multiple workers using a single social security number and unreported workers employed by small, illegal, labor contractors. A comparison of the Social Security numbers of farmworkers surveyed in the NAWS with EDD's UI files found that only 93% of NAW-identified Califoornia farmworkers' Social Security numbers were recorded in UI data, confirming the conjecture by many observers of the farm labor market that there is significant underreporting of agricultural employees. The Row 3 estimate includes only those workers for whose UI accounts earnings were reported by employers in an agricultural SIC code.

The Row 4 estimate of numbers of California farmworkers is based on total 1987 labor expenses reported by California agricultural employers. The estimate may be biased upward due to labor expenses for non-farmworker employees and by inclusion of expenses for fringe benefits. However, a very small proportion of agricultural workers receive a full fringe benefits package so this problem may not be as serious as it would be in other

industries. The estimated number of farmworkers in Row 4 is also sensitive to the particular data source used for hourly wages. The use of National Agricultural Statistics Service (NASS) wage data here generates a conservative estimate as the Farm Labor Survey sample is likely to heavily underrepresent farm labor contractor employees (who according to NAWS data receive substantially lower earnings than direct-hire employees) and consequently over-estimate wages.

Taking all of these uncertainties into account, the bottom line is that several independent data sources measuring the economic activity of the agricultural industry indicate a California farm labor force of somewhere between 563,000 and 720,000 farmworkers (SAS workers) while 1990 census data indicate a farm labor force of approximately 182,000 persons, a discrepancy we refer to as a mega-undercount to distinguish it from undercounts in the 5-10% range typically found in PES-based analyses of differential undercount, since the undercount is in the 60-70% range.

Comparison of the Profile of Census-identified farmworkers to NAWS-identified farmworkers as evidence of Cumulative Undercount

The utility of census data stems not only from the enumeration of population subgroups such as farmworkers but, also, from the demographic and socioeconomic profile it provides of such populations. In the case of farmworkers, a reliable demographic and socioeconomic profile is crucial for planning related to a variety of programs designed to meet farmworkers' health, education, and training needs.[20]

The evidence of a mega-undercount gives rise to concerns as to whether the census sample of one in three farmworkers is a biased or a representative sample of the entire farm labor force. In principle, it would be possible for the census sample to be a representative sample of farmworkers. However this possibility is not a very likely one since a large body of evidence already indicates a differential undercount not only from one racial group to another but from one socioeconomic and demographic group to another.

---

[20] For a detailed discussion of the relation of research data to farmworker program planning and policy development see Ed Kissam, "Everyday Realities and Effective Public Policy: The Case of Migrant and Seasonal Farmworkers", paper presented to 3rd annual meeting of Farmworker Service Agencies, May, 1993.

Comparison of the profile of those farmworkers who are identified by the census to "benchmark" profiles from specialized farmworker surveys and ethnographic studies provide direct evidence relating to the extent of bias in the census sample of farmworkers and indirect evidence of undercount -- since the extent of undercount can be inferred from comparing the census sample profile to the "benchmark" profile.

Comparison to the California NAWS

Because of California's pre-eminence in agricultural production, the National Agricultural Survey (NAWS) sample includes nine of California's 58 counties. Recent analyses of NAWS data collected during federal fiscal years FY '90 and FY '91 (October 1989-September 1991) provide a detailed profile of the California farm labor force in this area. Table 2 below compares the 1990 census PUMS data to the NAWS profile of California farmworkers.

Table 2
Comparison of 1990-1991 NAWS
and 1990 Census Profile of California Farmworkers

Profile Characteristic	1990 PUMS	1990-1991 NAWS
Gender	25% female	26% female
Age	36 yrs	34 yrs.
Marital Status	29% never married	29% never married
Birthplace - U.S.	19% born in U.S.	8% born in U.S.
Birthplace - Mexico	73% born in Mexico	82% born in Mexico
1987-1990 Immigrants	10% came in 1987-1990	9% unauthorized
Pre-1976 Immigrants	26% pre-1976	
Years of Schooling	5.7 years	6.3 years
English-speaking ability	42% speak English well or perfectly	20% speak English well or perfectly
Home language	84.4% non English	96.0% non-English
# of weeks worked in previous year	33.6 weeks	34.8 weeks
Hours of work per week	44.5 hours	38.2 hours
Mean wages in previous year	$9,994	between $7,500 and $9,999
Married with Spouse Absent	13%	31%

Table Notes

1. The comparison is based on PUMS and NAWS data for the 9 counties included in the sample -- Fresno, Kern, Kings, Imperial, Monterey, Sonoma, Tulare, Riverside, and Yolo Counties -- an area which, according to the census database contains exactly 50% of the California farmworker population. The Census PUMS dataset contains 5,789 cases within this geographic region while the NAWS dataset includes 1,844 cases.

2. The NAWS data was collected during seven cycles of interviewing over the two year period (a period which included the census single point sample).

3. Mean earnings of NAWS respondents is given as a range since earnings data are only collected in t range categories.

Comparison of the two farmworker samples in Table 3 shows that the primary difference between the 1990 Census sample of farmworkers and the NAWS sample is that farmworkers in the Census sample are much more likely to speak English well and much less likely to be married with a spouse absent. Census-identified farmworkers are, also, slightly older, more stably employed, and probably have higher earnings than the population of the NAWS sample.[21]

[21] Mean hours of work per week is a good measure of employment stability for farmworkers since marginal farmworkers are more likely to be partially unemployed during the peak season than local, settled,

The underrepresentation of workers who speak English poorly and whose spouses are not accompanying them provides a clue regarding the type of bias in the census sample of farmworkers. The differences between the two population samples suggests that the group of farmworkers most likely to be missed by the Census consists of unaccompanied Mexican-born males, who speak little or no English -- a state of affairs predicted by the research on causes of undercount (Fein, 1990) and the ethnographic alternative enumeration studies (e.g. Rodriguez and Hagan, 1990; Montoya, 1993; Garcia, 1992; Mahler, 1993). But if the hypothesis about differential undercount of back-and-forth male migrants is correct, it is surprising that both the Census sample of farmworkers and the NAWS sample appear to include a fair number of recent, post-IRCA immigrants.[22] However, we doubt the validity of the census data on year of immigration, due to semantic problems in the phrasing of the question in the Spanish long-form questionnaire and, possibly, fabrication. Another possibility is that the population missed by the census includes a disproportionate number of legalized long-time farmworker couples who are visiting their home villages in Mexico in March.[23]

There are other difficulties in inferring that recently-immigrated monolingual Spanish-speaking males are missed in the Census sample but not in the NAWS. The problem arises from the similarity between the two samples in the male/female ratio. We might expect the Census farm labor force profile to reflect relatively less males than the NAWS, if a predominantly male population of very recently immigrated males is missed in

---

long-time farmworkers. For a detailed discussion of hours worked per week as a measure of employment stability see Kissam and Griffith, 1991.

[22] It is likely that there is some fabrication regarding year of immigration in both the NAWS and the Census since workers know that it is possible to impute legal status from year of immigration (i.e. a post-IRCA arrival date). Other studies (Mason and Alvarado, 1990) have shown a large "bulge" of workers reporting they first came to the U.S. in 1986 -- the last year it was possible to arrive and be legalized under the SAW program. Another possible explanation of the similar proportions of 1987-1990 immigrants in both samples is that the census question on year of immigration asks when respondents came "to the U.S. to stay" -- a question usually interpreted as referring to the point at which a male "pioneer" migrant has sent for his wife to join him or, alternatively, the point of legalization, or achieving economic stability (Kissam, Herrera, and Nakamoto, 1993). Given a 5 year or greater lag between arriving in the U.S. and becoming legalized or sending for one's family would tend to push significant numbers of pre-IRCA immigrants into the post-IRCA category in the Census sample.

[23] Recently-arrived migrants with no papers are less likely to return to Mexico in the winter as they may be apprehended whenever they cross the border coming north. In contrast, legalized farmworkers (both SAWs and "green card" workers) can easily return to their sending villages annually. Some migrant circuits (e.g. Gomez Farias, Michoacan, to Watsonville, California are also known to include a high proportion of couples. Additional research is needed to better characterize the demographic profile of the full-range of different migrant streams in terms of age structure and male/female ratios.

the Census. The likely explanation for this puzzling state of affairs is that the census does in fact miss a disproportionate number of back-and-forth migrants (most of whom are male) but that it also fails to correctly identify settled female farmworkers as being farmworkers. The difficulty in identifying settled female farmworkers is likely to stem from their being more likely to have worked in intervening non-agricultural employment during the winter or early spring, thereby masking their attachment to farmwork (see the discussion in Section III)[24] It is also possible that the Census "snapshot" of the farm labor force slightly over-represents English-speaking in-school teenage workers (often the children of farmworkers) whose only participation in the labor force has consisted of summer work in the fields.[25]

Thus, the indicators of discrepancies between the Census sample of the farm labor force and the NAWS can be understood to stem from sampling and non-sampling error in which the Census successfully captures and identifies a "core" labor force of relatively securely employed long-term farmworkers employed during the winter while missing disproportional numbers among the more casual labor force of peak-season farmworkers -- including local, settled female farmworkers and transnational male migrants. Not surprisingly, both of these groups tend to be missed because they are "not in farmwork" at the point of the census sample. One group (the back-and-forth male migrants) are out of the country and the other group (the settled, married, women) are in another occupation.

One similarity between the NAWS and the Census sample of farmworkers which is not surprising even if the census, indeed, misses a high proportion of the most recently arrived male migrants is the similarity in educational level of the two samples. Because the educational levels of older "green card" farmworkers are consistently lower than the educational levels of more recently arrived farmworkers (Kissam, 1985; Griffith and

---

[24] Some considerations regarding the mis-identification of female farmworkers are the following. Women are more likely to work in processing work or other non-agricultural jobs (e.g. restaurant work, child care) during the winter than men. Also, the period immediately preceding census day includes a preponderance of tree-pruning tasks dominated by men. Other factors decreasing the representation of women in the Census sample may relate to women's reluctance to respond to census enumerators, or, possibly, discrepancies stemming from higher rates of allocation for non-respondent females. The fundamental difficulty in identifying women who work in farmwork as farmworkers stems from their more casual participation in the farm labor force than men, for whom farmwork is more likely to be a primary occupation. Women's lower attachment to the farm labor force is also related to the fact that their earning are, on the average lower, child care problems are consistent, and transportation is a barrier to working at distant sites.

[25] An analysis of 1980 Census data (Whitener, 1984) shows that the 1980 census data has a disproportionate number of very casual workers -- students and housewives. In Whitener's analysis this very casual labor force is identifiable by being White and English-speaking.

Kissam, 1991), it is possible for the census sample to both include more relatively well-educated U.S. born farmworkers and more aging "green card workers" while missing substantial numbers of recently immigrated workers with only an elementary school education but more years of elementary schooling than their parents.

Census data on the racial group of Latinos are so problematic that it is not possible for them to be used in analyzing the reliability of the census profile of California farmworkers.[26] Fortunately, place of birth and language spoken at home provide relatively adequate surrogates. It should be observed, in this context, that census data is reliable in identifying persons of Asian origin and that the census farmworker dataset includes an interesting indicator of which group of worker is captured in the census sample in the form of much greater than expected representation of FIlipinos (2.7%), suggesting again that the census does best at surveying and identifying settled long-term farmworkers.[27]

The other "fingerprint" of sample bias in this geographical area is the extremely low proportion of Mixtec-speaking farmworkers in the sample (i.e. 20 persons out of 112,000 in the 9-county area) while ethnographic research suggests that Mixtecos make up 5-10% of the farm labor force in this area.[28]

Based on the most extreme characteristic of sample divergence (English-speaking ability), it would appear that the census missed approximately 77% of the California farmworkers who spoke English poorly or not at all. This limited-English sub-group which is ommited from the Census sample of farmworkers appears to make up somewhere close to 60% of the total farmworker population in California.

---

[26] Hispanic responses to Q. 4 (Race) are unreliable since responses are scattered among "White" (the nominally "correct" answer and "other" (a common alternative response to the question. See Kissam, Herrera, and Nakamoto, 1993 for a detailed discussion of this problem. Hispanic origin coding is also problematic, due to documentation problems relating to code values of 001 and 005 for the PUMS (personal communication, Nancy Austin, California State Data Center).

[27] Filipinos comprised a significant minority in the California farm labor force up through the 1970's but the cohort of Filipino workers has now aged greatly and left farmwork by and large.

[28] There is now an extensive literature on Mixtec migration to California. Non-representation of Mixtecos in the 9-county area provides an indicator of sample bias because Mixtecos are heavily involved in the grape harvest in Fresno, Madera, and Sonoma counties. The FLSS Parlier case study (Kissam, Garcia, and Runsten, 1991) found 9% of the current farm labor force to be Mixtec.

Overview of the Analysis of Sample Divergence

Analysis of the divergent population profiles of census-identified farmworkers and the "benchmark" profile of farmworkers identified in the National Agricultural Worker Survey (NAWS) in California provides additional evidence of 1) a mega-undercount and 2) sample bias due to the omission of groups of peak-season farmworkers (settled females and transnational migrant males). Additional indicators of this sample bias can be found in the over-representation of Filipino farmworkers and the under-representation of Mixteco farmworkers.

The Implications of a Systematic Undercount of Farmworkers

Discussion of census undercount issues has tended to focus on the enumeration aspect of the Census of Population while giving little attention to the key recognition that the census is also a multi-purpose, multi-user data source designed to yield a rich variety of information on the demographic and socioeconomic characteristics of the nation. Because America's farmworkers are a population so distinct from the "mainstream" of America (as are many other hard-to-count populations) it is easy to immediately recognize that an adequate analysis of undercount must consider not only the extent of the undercount but the reliability of census data for constructing a profile of the population.

In this context, it becomes evident that it is necessary not only to quantify the extent of the undercount but, also, to examine how the undercount arises and what the analytic implications of this analysis of the causes of undercount may be. To accomplish this, it is useful to distinguish among different components of a "composite" undercount. Only by distinguishing these different components of undercount is it possible to determine the contribution made by migration to the 1990 census undercount of farmworkers.

Overview:Different Components of the Census Undercount of Farmworkers

The flow diagram in Figure 3 below identifies distinct factors implicated in the farmworker undercount and provides a conceptual "map" demonstrating the "cascade" of events which generate the very large undercount of farmworkers.

Figure 3
Different Components of the Census Undercount of Farmworkers

Component 1: Migration

Migrant FW out of U.S.
on April 1 -- not in Sample
Universe

Component 2: Total Household Omission

FW in the U.S. but entire
housing unit ommitted from
census sampling frame

Component 3: Partial Household Omission

FW housing unit in the census
sampling frame but some members
of household ommited from census
report

Component 4: Mis-identification

FW in censused household and
enumerated in census but not
identified as a farmworker

Cumulative Undercount = Component 1 + Component 2 + Component 3 + Component 4

This chart presents what is, essentially, a flow diagram of the events contributing to the census undercount of farmworkers. The first event in such a flow analysis examines how the undercount is generated from a farmworker being outside the sampling universe (not in the U.S.). Secondly, the farmworker may be in the sample universe but not in the sampling frame (living in a housing unit which is entirely missed due to lack of an address

or another reason). Thirdly, a farmworker may live in a housing unit which is sampled but not be reported by the census respondent. Finally, a farmworker may, in fact, be counted in the census but not correctly identified as a farmworker. Each "step" in the flow of events makes a separate contribution to the cumulative undercount and serves to introduce an idiosyncratic element of bias in the population profile.

In Figure 4 below, we present a matrix relating the different components of farmworker undercount outlined above to the types of data and analyses which provide evidence about the nature and quantitative contribution of each component to the cumulative undercount.

FIGURE 4
COMPONENTS OF THE FARMWORKER UNDERCOUNT
AND DATA SOURCES FOR META-ANALYSIS

	Type of Evidence				
Component of Undercount	**A. Ethnosurvey Data on Farmworkers**	**B.Direct observation-CSMR Alternative Enumeration Studies**	**C. Estimation Based on 1986 Causes of Undercount Survey**	**D. Comparison of Census of Population to Admin.e Datasets**	**E. Qualitative Analysis of Hispanics' Response Difficulties**
1. Migration -- U.S. FW, not in U.S	CAW studies FLSS NAWS (direct evidence)	Hillsboro, OR Guadalupe, CA Houston, TX (indirect evidence)	—	Inconclusive	—
2. Sampling error -- Total household omission	CAW studies FLSS NAWS (indirect evidence)	Hillsboro, OR (direct evidence) Houston, TX Long Island, NY Bronx, NY (indirect evidence)	Primary analysis	Inconclusive	Indirect evidence of non-return, non-followup households
3. Reporting error -- Partial household omission	CAW studies FLSS NAWS (indirect evidence)	Guadalupe, CA (direct evidence) Houston, TX Bronx, NY Long Island, NY (indirect evidence)	Primary analysis	Inconclusive	Direct evidence
4.Analysis error -- U.S. FW, mis-identified as being in another occupation	CAW studies FLSS NAWS (direct evidence)		—		—
5. Overall Cumulative Undercount	CAW studies FLSS NAWS (indirect evidence)	Hillsboro, OR Guadalupe, CA (indirect evidence)	Primary analysis of sampling and reporting errors, inconclusive re cumulative undercount	Direct evidence	Some evidence of sampling and reporting errors

Component 1 of the farmworker undercount stems from reliance on an April 1 "snapshot" to profile the U.S. farmworker population where, in actuality, a "movie" showing migration patterns throughout the year is needed to provide a full portrait of the population. Transnational migration patterns indicate that a significant number of back-and-forth migrants are "offstage" in Mexico at the time of the census snapshot. The fact that many migrants are transitioning from their "homebase" off-season residence to their first job of the spring on Census Day and during the followup period immediately after

Census Day, also, is likely to create difficulties in finding farmworkers in the census process but these problems are, in actuality, special cases of Component 2 (total household omission). Component 1 can be analyzed productively by relying on the ethnosurvey datasets on farmworkers because these data include annual migration histories.

Components 2 and 3 of the cumulative undercount of farmworkers are those associated with most current analyses of census undercount of minority populations -- i.e. estimates of persons actually not enumerated. For any given population sub-group, there will presumably be characteristic contributions to undercount stemming from total household omission.

Component 4 of the cumulative farmworker undercount is an analytic problem which, also, stems from reliance on a once-a-year snapshot of occupation as a means of yielding a profile of the farmworker population.

III. Analysis of Separate Components of the Farmworker Undercount

Given the evidence of a very substantial undercount of farmworkers and, moreover, a sample bias which tends to skew the demographic profile of the population, it is important, then, to consider, what contribution each of the different components described in the previous section makes to the cumulative undercount. Identifying the distinct components of the undercount, then, can provide a basis for considering what analytic and operational steps might yield a more reliable enumeration and profile of farmworkers.

Undercount Component 1: Migration out of the United States

U.S. labor-intensive agriculture has relied extensively on Mexican migrant workers since at least the 1920's (Nodin Valdes, 1990; McWilliams, 1971; Garcia y Griego, 1981; Farm Security Administration archives; CAW, 1993). While many different "push" and "pull" factors are involved in changing migration flows, the termination of the Bracero program in 1964 encouraged settlement in the U.S. by Mexican-born farmworkers, as did the availability of cheap housing in South Texas and the feasibility of follow the crop migration (Kissam and Griffith, 1991; Briody, 198_). However, developments in Mexico (e.g. the importation of contract workers from Oaxaca to Sinaloa and Baja California) and

in the U.S. (the SAW legalization program and chronic labor surpluses) have now begun to favor back-and-forth migration between Mexico and the U.S.

A number of factors affected farmworkers' 1990 migration patterns and, consequently, the numbers of U.S. farmworkers not in the U.S. on Census Day 1990. Because the SAW legalization program granted amnesty only to actual agricultural workers, not their non-working dependents, the immediate post-IRCA period has been one discouraging settlement and encouraging back-and-forth migration. Decreases in INS field raids and rapid recognition that forged employment authorization documents could be easily and cheaply acquired resulted in large surpluses of workers (both legal and illegal) during 1990. This probably increased the numbers of workers returning to Mexico who would, otherwise, have remained in the U.S. throughout the winter. At the same time, decreasing costs of migration (Massey and Garcia España, 1989; Donato, Durand, and Massey, 1992) probably encouraged back-and-forth migration.

While the technical definitions incorporated in the decennial census process stipulate that the U.S. population consists of persons residing in the U.S. on Census Day, the sociological and legal reality is that large numbers of transnational migrants who may seldom be in the U.S. in March or April are U.S. residents.[29] Thus, from both a practical and a policy standpoint, the single-snapshot census of population confronts the impossible problem of enumerating persons who are outside the sample universe.

In Table 3 below, we present the findings from selected Commission on Agricultural Workers case studies and the National Agricultural Worker Survey regarding the extent to which the 1990 undercount of farmworkers was affected by migration to Mexico.

---

[29] Most back-and-forth migrants spend the majority of their time in the U.S. Return visits to sending villages are of fairly short duration and may or may not occur on an annual basis (Massey and Alarcon, Durand and Gonzalez, 1987; Goldring, 1990; Mines, 1981; Mines and Martin, 1986; CAW, 1993). Legal residence does not necessitate continuous physical residence in the U.S.

Table 3
Farmworkers in Mexico on Census Day

Data Source Sample N	% in Mexico on Census Day,
Overall U.S. farmworker population NAWS national sample N= 2,604	14.0%
South Texas FLSS case study Weslaco, TX, N=56	0.0%
South Florida FLSS case study Immokalee, FL N=144	4.2%
Southwest Michigan CAW case study Berrien and Van Buren Cos. N=97	15.5%
Central Washington CAW case study Yakima Co. N=85	15.3%
California CAW case study Tomato workers -- San Diego, Fresno, and San Joaquin counties N=51	21.5%
California FLSS case study Parlier, CA N=120	25.8%

Table Notes

1. CAW studies are surveys of workers employed by a stratified sample of agricultural employers. The FLSS samples consist of labor force participants identified as current farmworkers (farmworker during 1989-1990) from a survey of the general population in farmworker-dominated communities.

2. The NAWS is a national probability sample from 73 agricultural producing counties. Details on the sampling methodology used for the NAWS have been published in annual reports.

3. The South Florida out-of-country population includes some Guatemalan farmworkers.

Not surprisingly, there is substantial variation in the proportion of the farm labor force out of the U.S. due to differences in crop production patterns and migration behavior of the different sub-populations of farmworkers. The low rate of out-of-country farmworkers in Immokalee, FL, for example, reflects the strong winter labor demand in

South Florida (in citrus and in winter vegetables). This rate is as low as can be found in most areas of the U.S. The absence of foreign-based migrants in the FLSS Weslaco, TX sample reflects the fact that the lower Rio Grande Valley farm labor force is dominated by "green card" workers, families who settled in the area prior to 1975. Contrary to popular belief, South Texas is not an important immigrant-receiving area, as migrants seeking U.S. farmwork head toward destinations in South Florida and California with more winter work opportunities than South Texas[30]

The areas with the largest proportion of farmworkers in Mexico are those which form part of a well-established migration circuits, where ties to home villages remain strong, and where there is a farm labor demand trough in March. Specifically, in Central Washington, the asparagus harvest very seldom begins before the second week in April making it attractive for many migrants to visit Mexico during an extremely slow period of work. The extent of out-of-country migrants in Parlier, CA, and the CAW tomato study and Yakima County, WA also reflects, in part, the extensive representation in the labor market of Mixtec workers, whose ties to home villages are extremely strong.[31] The ethnographic research in these areas shows the labor markets to be dominated by villages with strong traditions of northward migration (e.g. Zinapecuaro, Zitacuaro, and Purandero, Michoacan; Ciudad Altamirano, Guerrero; Salvatierra, Guanajuato; Santiago Naranjas, Oaxaca).

Southwest Michigan represents an intermediate case due to the fact that the labor force has heavy representation of Florida-based migrants (most of them immigrants but including some transnational back-and-forth migrants), Texas-based migrants (few of whom retain strong ties to Mexican villages), and Mexico-based migrants (most of them from core sending areas such as Guanajuato or from Guerrero). Since early season labor demand in Michigan is very weak (being composed primarily of year-round nursery work and a very limited demand for asparagus) we would expect to find a relatively high

---

[30] The large population of migrant and settled farmworkers whose homebase is in South Texas make the area a particularly inhospitable labor market for arriving migrants since access to limited amounts of winter vegetable work is heavily controlled by the family networks of troqueros who give preferential treatment to their families and neighbors. While many migrants pass through the area, their destinations are more likely to be Houston or Dallas, and, ultimately, Florida or some other area of the country.

[31] These are areas with a significant and growing Mixtec presence -- between 5 and 10% of the labor force. Field research among Mixtecs in California and Oregon(Runsten et al, 1993, forthcoming) includes accounts of workers returning home to fulfill their ritual duties in their home villages even after long residences in the U.S.

proportion of workers elsewhere in March. While some spend the spring in Florida or Texas, it is not surprising to find that others were in Mexico at this time of year.

The data derived from CAW studies and the fact that variations in extent of out-of-country migration are explainable in the context of ethnographic data on migration behavior indicates that the mid-level NAWS-based estimate of farmworkers out of the country in March and the first few days of April is, indeed, nationally representative.

Undercount Components 2 and 3: Household Omissions and Reporting Difficulties

There is an extensive and growing literature on the factors related to total and partial household omission from the census. While the earliest research addressed primarily broad correlates of differential undercount such as poverty rate, urban or rural residence, racial group, mail return rates), more recent research has focused more on specific sociological correlates of undercount (e.g. housing accommodations, respondent language, concealment, residential mobility).[32]

The research efforts most relevant to the issue of farmworker undercount stem from three sources: 1) the 1986 Causes of Undercount survey conducted in connection with the Los Angeles Test Census and 2) the 1990 series of ethnographic alternative enumeration studies sponsored by the Center for Survey Methods Research, and 3) analysis of Hispanic response to the census long-form.

In this paper, we address primarily the contribution made by the Causes of Undercount research effort (Fein, 1989; Fein and West, 1988; West, 1988) to an understanding of farmworker undercount. The ethnographic alternative enumeration studies, both those which assessed undercount in farmworker communities (Garcia, 1991; Montoya, 1993) and those which examined urban areas with high proportions of immigrants (Rodriguez and Hagan, 1991; Romero, 1992; Stepick and Stepick, 1992; Wingerd, 1992; Dominguez and Mahler, 1993; Mahler, 1993) provide extremely valuable

---

[32] Excellent reviews are abailable in National Academy of Sciences, America's Uncounted People, 1972; Peter Hainer, Catherine Hines, Elizabeth Martin, and Gary Shapiro, "Research on Imporving Coverage in Household Surveys", __; and in Citro and Cohen, 1985.

empirical confirmation for the theoretical framework advanced by Fein to explain the multiple factors involved in undercount.

Total Household Omission

Fein and West distinguish between two different types of total household omission -- the omission of an entire household due to failure to enumerate a physical housing unit and the omission of an entire household in an enumerated housing unit. Specific reasons identified for missing entire housing units include factors related to census implementation (address list omission, erroneous deletion) and factors related to the social context of hard-to-count populations (e.g. the physical characteristics which affect unit visibility. Each of these factors makes an important contribution to the farmworker undercount.

Recent ethnographic research indicates that the housing conditions prevalent in farmworker communities can be expected to give rise to extremely high rates of total household omission. Address listing problems can be expected to be serious because many farmworker housing accommodations have no address at all (e.g. barns, shacks, toolsheds, shantytown camps in remote areas, mobile homes in crowded ghettoes, or on farms). The substandard housing available to farmworkers is, also, extremely susceptible to erroneous deletion -- because the housing unit is judged to be unfit for human habitation (e.g. toolsheds, barns), or because the housing unit appears to be vacant. Many farmworker housing units are of the type which Fein and West refer to as generically "unusual" because of their low social visibility. Fein and West also note that low social visibility stems not only from inadvertent omission of such units from the sampling frame but, also, active concealment.

Living in illegally subdivided housing is a feature not only of life in urban immigrant-receiving areas but, also, in rural areas populated by farmworkers. In areas such as that of the CAW Central Washington study, crowded farmworker housing includes not only "complex households" living in single-family homes in small rural towns such as Toppenish and Wapato but, also, extremely crowded (and illegally subdivided) apartment in Yakima's urban eastside.

Moreover, substantial numbers of farmworkers actually live in urban communities. Major farmworker communities in areas such as Homestead, FL; Salinas, CA, Yakima, WA, McAllen, TX, Fresno, CA, Bakersfield, CA are actually mid-size urban areas or

adjacent to urban areas. In other cases, major urban such as Chicago, IL and Santa Ana, CA actually contain large numbers of farmworkers. For example, the urban farmworker areas studied by Gabbard and Goldring in 1989 actually include many of the neighborhoods of the Los Angeles TARO and the Causes of Undercount Survey.[33] Gabbard and Goldring observed farmworkers in their study area concentrated in low-income areas between the railroad tracks and freeways.[34] Similar residential patterns can be observed in East Bakersfield where farmworker families originally settled near packing sheds along the railroad, in areas which are now heavily urbanized.[35]

In some areas, of the U.S. large numbers of farmworkers are homeless, living in makeshift camps of cardboard shelters in canyons (e.g. San Diego County, CA), hidden in large orchards or groves (e.g. Immokalee, FL), or living in abandoned vehicles. Several California case studies of pesticide poisoning incidents implicate "camping out" in pesticide-treated fields and suggest these are not isolated instances.

In remote rural areas, farmworkers living in grower-owned barns or dilapidated housing or sheds will not be enumerated because the "main house" is the only dwelling with an address. The dwellings where farmworkers live are physically hidden, and often, abandoned-looking, and illegal because they violate building codes.

Many housing units occupied by farmworkers in the central areas of farmworker towns in California are likely also to be omitted, because they consist of rooms illegally rented out, primarily to "lone male" farmworkers. Detailed mapping conducted in January, 1990 study of a farmworker community in Fresno County revealed, for example, that 39% of dwelling units on one block were of the low-profile, concealed sort, and that 12% of all the units of the random sample of blocks in the enumeration district fit this profile.[36]

---

[33] Unpublished field notes, Susan Gabbard, EDD study, 1989; personal communication, David Fein, 1993.

[34] Susan Gabbard and Luin Goldring, "The Occupational Mobility of Current and Former Farmworkers: A Comparative Analysis of Two California Labor Markets", California Agricultural Studies,Series, Employment Development Department, 1991

[35] Ed Kissam field notes, 1980, DOL documentary project.

[36] Unpublished mapping notes, Ana Garcia, FLSS, 1990.

Illegal additions to existing housing units in farmworker communities present a special case of the "duplex" problem where what appears to be a single dwelling is, in fact, two (or even more) units occupied by other families or individuals.

Special efforts by the Bureau of the Census to count migrant and seasonal farmworkers focused on outreach to licensed migrant camps; however, nationally, few of these camps are open on April 1--Census Day. In California, none of the state migrant camps open before May 1. In the Southwest Michigan CAW study area most camps were only licensed for occupancy from May through September. Many other "migrant camps" are neither recognized as camps nor licensed. These camps include run-down trailer parks, business premises allocated to housing workers, and clusters of outbuildings, or toolsheds.

Living in Crowded Housing leads to Census Omission

Crowded living conditions for farmworkers create a situation where entire groups of farmworkers living in a dwelling may be omitted from the census. The omitted groups are particularly likely to include unrelated persons or distant relatives living in illegally partitioned quarters which they rent from the property owner. While ambiguities about definitions of residence play an important role in partial household omissions (West, 1988), even more serious operational problems also exist as households of more than seven persons must be listed on supplemental census forms. The Farm Labor Supply Study (FLSS) shows an average farmworker household sizes of 7.3 persons in Central California (Parlier).

Recent research on Hispanics' response to the census long-form (Kissam, Herrera, and Nakamoto, 1993) suggest that the most serious definitional ambiguities with respect to reporting persons in family units relate to persons often referred to in the literature as boarders. In the case of the farmworker population these are usually recently-arrived back-and-forth male migrants. Even where overall undercount rates are low because housing units are highly visible (e.g. single-family farmworker homes in Guadalupe, CA) boarders are the sub-group most likely to be ommitted (Garcia, 1992). Partial omissions also are particularly likely to occur in large "crash pad" accomodations consisting of multiple sub-groups of unaccompanied male migrants.[37]

[37] A relevant finding from the FLSS ethnographic research is that labor surplus areas described as "upstream nodes" of migrant networks with labor surpluases have, in the post-IRCA period a high

Extensive crowding has been reported in Madera County (Bade, 1990)[38] and in Fresno County (Griffith and Kissam, 1991) in California, as well as in Florida. Bade reports cases where 37 men were living in a garage; the ethnographic work in Fresno County reveals a similar level of crowding among recently immigrated dwellings of lone males. One semi-isolated ranch in the Parlier, CA area, for example, has three outbuildings occupied by 30 workers. In another such "complex' household in Fresno County, the recently-immigrated men living in the living room of a two bedroom house (with 19 residents) did not know who lived in the bedroom because it was separately rented.[39]

Ethnographic research strongly suggests that the sub-group among farmworkers mostly likely to be ommitted are individuals unrelated to the head of household or to "Person 1" the person who actually responds to the census long-form.

In the case where many unaccompanied workers share a crowded single-family home, apartment, or barn, the census respondent may literally not know who exactly shares his or her quarters (or much about those they do know). In the case where a nuclear family or extended family rents part of their quarters to one or more boarders, there are likely to be active efforts to conceal the existence of another family. In Parlier, CA, for example, a woman who rents her patio and backyard to workers who camp there on cots regularly denies that she has any boarders, although neighbors observe the arrival of new migrants who arrive in a taxi from Fresno.[40] In Parlier, the influx of arriving migrants leads to so much residential crowding that the city's sewer system becomes over-burdened.[41]

Ambiguity of residence does not play as major a role in partial household omissions in many of the farmworker communities studied in the FLSS and the CAW case studies as

---

proportion of arriving migrants with only weak network connections. It is in these households where co-tenants are least likely to know each other.

[38]Bonnie Bade, "Migrant Farmworker Needs Assessment", University of California Cooperative Extension. January, 1990

[39] Anna Garcia field notes, FLSS/Parlier, 1990.

[40] Anna Garcia field notes, FLSS/Parlier, 1990.

[41] E. Kissam field notes, FLSS/Parlier

in urban neighborhoods such as those studied by Hamid or Rodriguez and Hagan (Rodriguez and Hagan, 1991; Hamid, 1992). However, ongoing research in Immokalee, FL indicates that some very crowded camps may have a significant number of transients.whose probability of not being reported in any household is high[42]

While conventional wisdom associates rural areas of America with low undercount due to the prevalence of stand-alone single-family residences, the reality of farmworker communities is that farmworkers live in crowded, unsanctioned, low-visibility housing accommodations. Structurally, then, farmworker living arrangements are more akin to the inner-city accommodations described in ethnographic studies of immigrant-receiving communities such as the South Bronx, Long Island, Houston, San Francisco, and Miami than the American midwest.

Summary -- Total and Partial Household Omission

Definitional problems stemming from the difficulty in distinguishing whether some sorts of crowded housing arrangements should best be described as separate housing units or separate social or household groups within a single housing unit make it difficult to determine definitively exactly what contribution each type of omission makes to farmworker undercount. What can be said with some certainty is that problems in constructing an adequate sampling frame in farmworker communities are likely to play a much greater role in undercount than reporting problems stemming from definitional problems, inadvertent omissions, etc.

The type of factors involved in omission of an entire household or household sub-group from the census enumeration process indicate that these omissions would tend to bias the demographic and socioeconomic profile of census-identified farmworkers since some types of persons are much more likely to live in the kind of accommodations that increase his or her probability of exclusion from the sampling frame or a long-form report by a single respondent of all the persons in a given crowded housing unit. The ethnographic and survey research tend to confirm both the existence of a mega-undercount (e.g. Montoya's report of a 50% omission rate in his Woodburn, Oregon alternative

[42] E. Kissam field notes, Inter-ethnic Relations in South Florida/NSF, 1993. More marginal workers, including both recently-arrived migrants, alcoholics, and ethnic minorities within the Latino population, were observed to have ambiguous residential arrangements occasionally, "camping" with one group of work acquaintances or another.

enumeration) and the existence of sample bias of the sort inferred by comparing census data on farmworkers to alternative data sources.

Language and Educational Factors Implicated in Undercount

The conceptual model developed by Fein and West to describe the interaction of the social system and census operations to give rise to undercount indicate that language ability and education were significantly correlated with definitional errors but that in multi-variate analysis the education effect was not significant. Clearly, receipt of a mailed English-language census form presents a substantial response barrier even to motivated non-English speaking persons.

However, recent research on Hispanics' response to the census long-form (Kissam, Herrera, and Nakamoto, 1993) indicates that low functional literacy (as indicated by educational level) also plays a major role in response difficulties even if the respondent receives the Spanish-language long-form (by calling the 800 number on the face of the English-language form). It is hypothesized that overall level of respondent burden becomes very high for low-literate respondents, thereby resulting in much higher non-response rates, which, in turn, swamp census followup efforts to conduct face-to-face enumerations. This is particularly significant with respect to farmworker undercount because of the high proportion of non-English speaking farmworkers with very low levels of education . It suggests the likelihood of local "hot spots" of non-response due to the prevalence of immigrants. This finding is also consistent with the strong effect exerted by the ethnic enclosure variable on undercount in Fein's regression model (Fein, 1989).

In general, a definitive assessment of the factors involved in farmworker undercount will need to examine possible differences between census operations in connection with the 100% sample and the long-form sample, since farmworkers, of course, can only be identified in long-form data.

Quantitative Assessment of the Contribution of Total and Partial Household Omission to the Farmworker Undercount

An inevitable shortcoming of the ethnographic research on census undercount is that high-quality ethnography is best done in a community case study context. Thus, the alternative enumeration research, as well as recent ethnographic studies of farmworkers

provide important insight into the causes and mechanisms of undercount but, by design, cannot provide an overview of the full extent of the actual farmworker undercount, that is, farmworkers in the U.S. during the census, irrespective of whether they were identified as farmworkers or not. (i.e. undercount due to Components 2 and 3 of cumulative undercount).

In the following section we use the regression model developed by David Fein on the basis of the Los Angeles Test of Adjustment-Related Operations (TARO) to estimate probabilities of total and partial household census omission of Latino farmworkers The Los Angeles test was, as Fein observes, a fortunate test site, in particular because it provides a good basis for exploring the causes of undercount among an immigrant population, and particularly "social structural" factors such as complex living arrangements.

Since the National Agricultural Worker Survey (NAWS) has high-quality survey data on the national farmworker population, the analytic strategy is to estimate the level of farmworker undercount by applying Fein's model to the Latino (primarily Mexican) farmworker population profiled in the NAWS.[43] The simulation tests two variants of Fein's logit models -- Model V and Model VI. In contrast to alternative formulations of the models, these two models take into account structural characteristics which the ethnographic research suggests are important in understanding farmworker undercount -- residence in an "unusual unit", ethnic enclosure, and the presence of recent immigrants in the household. Each model generates separate estimates of the probability of partial and total household omission. Our analysis examines separately both these probabilities and the overall probability of omission.

Simulation Methodology-- Data Comparability Issues

Figure 5 below provides an overview of the variables in the Causes of Undercount Survey (CUS) used to construct Fein's Model V (All Social Factors) and Model VI (Immigration Only) and the corresponding data elements from the NAWS used for estimating the extent of undercount

[43] See Susan Gabbard and Richard Mines, "How survey methodology shapes farmworker characteristics: comparisons of the National Agricultural Workers Survey and the Hired Farm Work Force", Office of Policy, U.S. Department of Labor, forthcoming, 1993.

Figure 5
CUS variables used in Fein Models V and VI compared to NAWS variables

#	Variable	CUS Definition	NAWS Definition
1	Intercept	Intercept	Intercept
2	HH size	All household members	All residents over 15 yrs of age and respondents' children under 15.
3	Non-nuclear HH	All members of the household are not nuclear family members	All members of the household are not nuclear family members
4	Nuclear + Non-Nuclear HH	Household has both nuclear and non-nuclear family members	Household has both nuclear and non-nuclear family members
5	Infant in the household	Household contains at least one 0-4 year old	Not available
6	Young adult in the household	Household contains someone age 20-29	Includes farmworkers age 20-29 plus prorated portion of adults in household
7	Tenure	Renters	Renters
8	Poor English ability	Head of household did not speak English well	The farmworker respondent does not speak English well
9	Young adults with poor English ability	Positive responses on both variables	Positive responses on both variables plus some pro-rated
10	Single family attached unit	Townhouses or other attached units (incl. garages)	Not available
11	Unusual unit	Non-standard housing	Non-standard housing
12	Non-citizens in the household	At least one non-citizen in the household	Farmworker respondent.
13	Welfare status	Household currently receiving welfare	Household received welfare within the last two years. This results in a slight overestimate
14	Adult males in the household	At least one adult male in the household -	Total males 14+,
15	Number of rooms		Not available
16	Believes in census confidentiality		Not available
17	Welfare household who believes census is confidential		Not available
18	Ethnic enclosure	% of census tract minority	Estimated on the basis of ethnographic data
19	Settled immigrant	Immigrant who has been in the United States for 7-11 years	Immigrant who has been in the US since 1979-1983
20	Recent immigrants	Immigrant who has been in the US for 0-6 years	Post-IRCA immigrant -- person in US for 0-4 years. This results in an underestimate but takes into account legalization watershed of IRCA

The primary differences of comparability between the CUS dataset and the NAWS dataset stem from the fact that the NAWS research design was developed to generate a full set of data on the survey respondent and his or her dependents but only partial data on other persons in the household. Other problems of comparability (e.g. differences in base period for designating a household as receiving welfare) are likely to have relatively little effect on the estimates.

For variables in both the CUS and the NAWS, two factors account for most of the definitional differences. First, since the NAWS collects household data to provide information on labor supply, NAWS household data omit individuals under 15 years of age (unless they are the respondent's own children). This means that NAWS averages underestimate household size. Smaller average households bias downwards the estimation of probability of total household omission and bias upward the partial omission rates. The impact on combined probabilities of omission is negligible.

Secondly, the NAWS data reflect the characteristics of a sampled farmworker who may or may not have been the census head of household (or Person 1). This affects the comparability of the English-speaking ability variables. However, this means that the NAWS-based simulation uses an average estimate of household adults' language ability. The simulation will have a bias to whatever extent the household head may be presumed to have above-average English skills. However, in the model being used, the head of household's poor English skills did not increase the probability of Census omission.

Since the NAWS collects age and gender data only on the respondent, these variables can only be calculated with certainty for households where the respondent has the required age and/or gender. That is, a NAWS household contains a young adult if the respondent is 20-29 years old or the NAWS household contains an adult male if the respondent is male and 30-59 years old. Presence of a young adult is inferred when the respondent has children over age 14 and when the farmworker is between 35 and 59 years old. Similarly, presence of an adult male in the household is infered when the respondent is 15-30 years old and two parents are present in the household.

Even with these adjustments, the NAWS variables clearly understate the number of households with young adults or adult males. Since these variables have positive

coefficients in both the partial and total omission equations, the overall effect is to understate the extent of census omissions among farmworker households.

Model VI includes an interaction term for households containing young adults where the head speaks English poorly. The potential bias of this variable is more difficult to assess, since the incidence of poor English is somewhat overstated and the incidence of young adults is understated. However, the degree of understatement of young adults should overshadow the small overstatement of English ability. In that case, a positive coefficient on the interaction term in both equations indicates that the net effect is to understate Census omission.

While it is beyond the scope of the current analytic effort to estimate levels of ethnic enclosure for all the census tract in which NAWS respondents lived in March, ethnic enclosure is itself used in the Fein model as a proxy for the structural characteristics for the type of immigrant-dominated communities in which farmworkers are most likely to live as demonstrated by the ethnographic research. The fundamental structural characteristic common to ethnically enclosed census tracts in the Los Angeles TARO and farmworkers' residence tracts is that they represent "third world" communities within the United States.[44]

Fein hypothesized that social factors may have independent and opposite effects on the two types of census ommission -- total and partial household ommission. For example, larger households attract more attention and are less likely to be totally ommitted. They take up more space; have more cars in the driveway; are more likely to have someone at home, or in other ways are more noticeable than small households. Conversely, larger households are more likely to allow omission of one or several members (for example, one or more boarders or an entire sub-family). Because variables in Fein's equations tend to have opposite effects in the partial and total omission models, biases resulting from differences in variable definitions between the NAWS and the original CUS data elements tend to be off-setting and have small impact on total probability of individual omission.

---

[44] See David Hayes-Bautista, "Latinos and the Future of Los Angeles", Latinos Futures Task Force, 1992 for a discussion of the structural characteristics of Los Angeles. See also, Goetz Wolff, The Making of a Third World City? Latino Labor and the Restructuring of the LA Economy", Paper presented to the XVII International Congress, Latin American Studies Association, September, 1992. For a discussion of rural California communities see Michael Kearney and Carole Nagengast, "Anthropological Perspectives on Transnational Communities in Rural California", California Institute for Rural Studies Working Paper #3, 1989.

In Figure 6 below, we report the values of NAWS variables used to estimate the national undercount of farmworkers.

Figure 6
NAWS Values for Estimating Total and Partial Household Omissions
CUS Models V and VI

	Sample Means		Logit Coefficients from Household Omission Models			
Household Characteristic	CUS	NAWS	Model V All Social Factors		Model VI Immigration Only	
	Mean	Mean	Total HH	Partial HH	Total HH	Partial HH
Latino	74%	100%				
Intercept			-1.591	-2.432	-1.869	-1.806
Number of Rooms *	4.6	-	-0.143	-0.012		
Household Size * +	4.7	4.0	-0.136	0.291	-0.141	0.330
All Non-nuclear	10%	38%	0.230	0.837		
Extended Family	31%	16%	-0.779	0.527		
Infants in Household	26%	-	0.352	-0.366		
Young Adults in Household	52%	37%	0.712	0.225		
Renters	47%	86%	0.140	0.367		
Poor English Skills	28%	94%	-0.059	-0.599		
Poor English and Young Adults			0.762	0.886		
Single family attached unit	12%	-	0.656	0.044		
Unusual Unit	9%	20%	0.549	-0.019		
Non-citizens present	43%	86%	0.008	0.040		
Welfare Recipient	21%	6%	0.777	0.864		
Adult Males in Household	65%	44%	0.299	0.457		
Believe Census is Confidential	64%	-	-0.171	-0.090		
Welfare Recipient believes in Conf.			-1.539	-1.122		
Ethnic Enclave	78%	-	0.968	0.700	1.637	0.634
Established Immigrant in household	10%	47%	0.727	0.007	0.853	0.009
Recent Immigrant in household	25%	39%	0.607	0.885	1.004	1.088

** These CUS means were constructed from midpoints of reported categories.*

+ The standard deviation for household size is 2.1. The range is from 1 to 25. Standard deviations for NAWS variables expressed as as percentages is 1%.

Simulation Methodology -- Estimating the combined effect of total and partial household omission

To simulate the census undercount of Latino farmworkers, the probabilities of partial and total Census omission were calculated using the coefficients from Fein's models and data on the 2,200 Latino farmworkers from the 1990-1991 NAWS

While Fein did not directly estimate the impact of social factors on an individual's probability of being omitted, these probabilities also were calculated. Since total and partial household omission are, by definition, independent events, the total probability of Census omission equals the sum of the probability of omitting the household plus the probability of including the household but omitting the individual. The first element can be calculated directly using the estimated coefficients for total household omission. The second component is the probability of partial household omission calculated from Fein's equation times the probability that the omitted individual was the sampled farmworker.

For these simulations, it was assumed that only one person was omitted from each household where partial omission occured. This is the minimum credible assumption. It is probable that, in fact, in some households more than one person is omitted from the census listing -- a couple, an extended family member, or a boarder left off the census report for social-structural reasons.

Since no model existed to identify which household member to omit, the probability that an individual was ommited is considered to be proportionate to household size. This definition means that in two-person households, the probability is one-half, in three person households, one-third, and so on. Since we have omitted unrelated children, this may bias upwards the probability of being omitted. However, this bias is offset by the conservative assumption that only one person on the average is missed per household. One individual, on average, represents 27% of the household members.

The simulations show that Latino farmworkers have about a 50% chance of Census omission (see Table 4 below).[45] The most likely cause of this omission is that the entire household was missed by or concealed from the Census.

---

[45] The simulated probability that the Census omitted a Latino farmworker was calculated for all five of Fein's CUS-based models. The probabilities ranged from 43% in a model that did not include immigration

Table 4
Simulated Probabilities of Census Omission for Latino Farmworkers

Undercount Components	Model	
Probability that a Latino farmworker is omitted from the Census because of:	Model V All Social Factors	Model VI Immigration Only
1. Total household omission	40%	43%
2. Partial household omission	8%	9%
3. Combined Probability	48%	52%

* *Averaged over all farmworkers, not just those in households with two or more members.*

The probability that a Latino farmworker lives in a household missed by the Census averages 40% when the model includes all social factors and 43% when the model considered only the effects of immigration.[46] Thus, total household omission accounts for almost 80% of the Latino farmworker undercount in the Census.

Workers in households with two or more members have a probability of being partially omitted from the Census. Since by definition, partial household omission cannot occur in single person households, the figures on total household omission apply to households of two or more individuals. For these households, the average probability that a farmworker lives in a household where someone is omitted from the Census form is 58% when all social factors are considered and 64% for the immigration only model only.[47] While partial household omission occurs more frequently than total household omission, its impact is smaller since at least some of the farmworkers in the household are counted. Based on household size, the average probability of being the omitted person is 27% for

---

variables to 56% in a model based only on household size and composition. The probabilities of Latino census omission averaged 50% over all five models.

[46] All five of Fein's CUS logit models were simulated. Rates of total household omission ranged from a low of 34% in a model that omitted immigration variables to a high of 45% in a model that considered only household size, composition, and tenure. The average probability of total household omission for all five CUS models was 41%.

[47] Simulated probabilities for partial household omission range from a low of 58% when all social factors are considered to a high of 75% when only household size and composition are considered. The average probability of household omission is 63% for households of two or more individuals.

households with two or more members. This results from the fact that the simulation omits one person per household and those households with two or more members actually have, on the average, slightly less than five members. Thus, if 58% of the time, someone in a household is omitted and on average 27% of the household is missed, then the probability that a particular individual is missed due to partial household omission is 13% for the model with all social factors and 14% for the immigration-only model. Thus the contribution of partial household omission to undercount is much lower than that of total household omission.

To find the contribution of partial household omission to overall Census omission, the probabilities of partial omission are averaged over the whole farm workforce (not just two or more person households). These calculations reveal that the probability of partial omission for Latino farmworkers as a whole is 8% and 9% respectively in the two models.

Assessing the Impact of Different Types of Omissions on the Farmworker Demographic Profile

The Table 4 figures on total and partial household omission give an indication of the magnitude of the farmworker undercount problem. However, these figures indicate only the impact of omission on the total number of Latino farmworkers counted. There is a second impact of undercount components. Total and partial household omissions tend to skew the demographic portrait on farmworkers who are counted. An analysis combining information on the magnitude of each omission component with a detailed look at the coefficients of the undercount model provides insights into the direction of this distortion. By assessing separately the contribution of partial and total omssion to overall omission is important as a means of ascertaining the impact of variables that have opposite impacts on these two separate components.

The seriousness of the demographic distortion depends both on the coefficients which indicated the weighing of social factors in the model but also on the prevalence of those factors among Latino farmworkers. For example, although welfare status has a relatively large coefficient in Fein's undercount model, few farmworkers receive welfare so the impact of this factor on farmworker undercounts is small.

When all social factors are considered, the factors with the largest effect on total Latino household omission are living in a small household, being in a nuclear or non-

nuclear household, having young adults (especially in households where the head has limited English skillls), renting or living in an unusual type of housing or in an ethnic enclave, and being an immigrant household. Thus, this element of the model implies that the Latino farmworkers most likely to be missed by the census are small immigrant families or farmworkers who live in a disguised second or third housing unit: typically, young men living in a tool shed, garage, or barn, or the young couple living illegally on a porch, or in a basement.

Partial omission gives rise to a different type of skewed representation. As would be expected, housing variables have little effect on partial omission. Rather it is the household composition variables that are more important. The Fein model shows that those Latinos likely to be partially omitted live in extended or non-nuclear families, are older men or young men in households with limited English proficiency or recent immigrants or those who live in ethnic enclaves.

It is interesting to note that while all immigrant households are almost equally at risk of total omission, the risk of partial omission is very small for established immigrants. The main impact of partial household omission is on recent immigrant households. The results of the Fein model, thus, support the findings by Kissam, Nakamoto and Herrera (1993) that in Latino households, the individuals most likely to be omitted are peripheral household members who are recently arrived immigrants, unrelated tenants or boarders, or distantly related kin or sub-families residing in complex households.

While the countervailing effects of some variables may cancel out when calculating the combined effects of total and partial household omission, certain factors are consistently linked to undercount in both calculations. At risk for both partial and total household omission are recent immigrants and young farmworkers, particularly those living in non-English speaking households. Since young Latino immigrants with limited English proficiency make up a large portion of the form workforce the portrait of Latino farmworkers is skewed toward more established immigrants and those with better English skills.

In summary, Fein's models suggest that total household omission has a greater impact on farmworker undercount than partial household omission. Farmworkers tend to live in unusual housing units, ethnically enclosed and linguistically isolated neighborhoods, or isolated, concealed sub-standard housing. However, (as we discuss in connection with

Component 4 of the composite undercount in the following section), problems with mis-identification of marginal farmworkers means that some members of censused households do not appear in PUMS data on farmworkers.

Conservatively, 50% of Latino farmworkers are missed by the Census. Since Latino workers comprise at least 72% of the farm labor force, then the Latino undercount alone results in a 38% overall farmworker omission stemming from Components 2 and 3 of census undercount.. To the degree that non-Latino farmworkers experience the same social factors determined in the Causes of Undercount Survey to affect omission, they, too, will be ommited from the census.[48] By the same token, sub-groups within the farm labor force (e.g. harvest workers) will experience a disproportionate undercount.

The national average undercount of Latino farmworkers estimated using Fein's logit models is consistent with the findings from ethnographic research such as the alternative enumeration in Woodburn, Oregon, with the estimates of undercount derived by comparing California census data with alternative data sources, and with estimates based on the observed skewing of sample composition between the California NAWS and the census count of farmworkers for the 9-county NAWS sample region.[49] Essentially, local areas with active transnational migration networks are likely to be at the high end of the undercount range, while the lowest undercount will be in communities with low levels of immigration and minimal levels of transnational migration.

It is also worthwhile to observe that the minimal undercount in a farmworker community studied by Victor Garcia (Guadalupe, CA) is, also consistent with the Fein model since the neighborhood in Garcia's alternative enumeration effort was an idiosyncratic one, composed primarily of settled long-time farmworkers, living in detached single-family homes, exactly the sort of community and population which Fein's model

---

[48] FLSS Ethnographic observations, field mapping, and survey data from Immokalee, FL, a farmworker community with a relatively high proportion of non-Latino farmworkers (e.g. Haitians and African-Americans) suggest that the social factors found to affect undercount in the Los Angeles context applies equally to a wide range of farmworker communities.

[49] AS noted above, the FLSS study communities and the CAW case study areas may be somewhat more Latinized than other communities and, thus, have a higher overall undercount than the national undercount but the geographical patterns of differential undercount within the farm labor force are likely to be different than is commonly assumed -- since Florida and some other areas of the Eastern seaboard probably have as great influxes of recent immigrants as the western U.S. Additional research is needed to assess the effects of the multiple components of undercount in different farmworker communities and regions.

and our analysis of sample bias show to be best counted in the census process. And, in fact, the bulk of omissions observed by Garcia were partial household omissions of boarders.

Thus, while farmworker undercount stems in part from migration (Component 1), there is also evidence of a mega-undercount in terms of "classical" concepts of differential minority undercount (Components 2 and 3). In the following section, we examine the extent to which analytic difficulties in identifying farmworkers in census data (Component 4) further contributes to the cumulative undercount and skewed population profile of census-identified farmworkers.

Undercount Component 4: Analytic Difficulties in Identifying Farmworkers

Difficulties in identifying farmworkers has long been recognized to be a serious analytic problem in using census data on farmworkers for policy analysis or program planning (Whitener, 1984; Martin, 1984). Occupational classification of census respondents is based on long-form Question 29 (What kind of work was this person doing?). The difficulty in identifying farmworkers within the census dataset stem from the fact that many farmworkers are unemployed during the last week of March (i.e. the reference week for occupational classification). Question 29 instructions direct an unemployed respondent to report what type of work they did in their last job. However, if this "last job" was a non-agricultural one, this job "blocks" identification of the respondent as a "current farmworker".

It is, of course, not surprising that the labor force in the most seasonal occupation in the United States combines work in farmwork with work in other non-agricultural (often low-wage) occupations.

The findings of recent research on farmworkers' overall economic strategies, however, emphasize more than previous research the extent to which farmworkers combine work in multiple low-wage jobs to achieve a minimum survival standard. For example, National Agricultural Survey data show that 36% of seasonal agricultural services workers performed non-SAS work during 1989 (Mines, Gabbard, and Boccalandro, 1991).

Farm Labor Supply Study data provide a measure of how regional variation can affect farmworkers' labor force participation strategies. For example, FLSS work history

data show that only 17% of the current farmworker heads of household in Immokalee, FL, combine farmwork and non-agricultural work, but that 54% in Parlier, CA , and 69% in Weslaco, TX regularly combined farmwork with non-agricultural work.[50]

Farmworkers do, indeed, work in a secondary labor market but that labor market is not confined to farmwork. While it is tempting to dismiss the difficulties in identifying current farmworkers as farmworkers in census data as a "definitional" problem, there are, in fact, strong analytic reasons why national data should provide the basis for identifying the entire farm labor force (not simply those atypical workers who continue to be employed in the off-season). The rationale for a robust definition of "farm labor force" (including both peak season and off-season workers) stems from the need for this sort of data for consideration of immigration policy alternatives, assessment of employment policy alternatives to address the many problems faced by immigrant workers whose employment is not only poorly-paid but chronically unstable, and the need for such data in planning programs specifically targeted to migrant and seasonal farmworkers.[51]

In Table 5 below we present the findings from an analysis of work history data from the NAWS (at the national level) and the FLSS and CAW case studies as a measure of variation from area to area in the extent to which current farmworkers are mis-identified as belonging to another occupational group. Analysis of the rate of mis-identification of current farmworkers is based on review of work history data on the March employment of workers who were in the U.S. at that time.

---

[50] Re-tabulation of Table 6-4 (Griffith and Kissam. 1991) Including persons who are not heads of household in the tabulation would increase the proportion of workers who combine farmwork with other sorts of work since, as noted above, women and teenage workers have better access to non-agricultural work than do male heads of household.

[51] See Ed Kissam. "Everyday Realities and Public Policy: The Case of Migrant and Seasonal Farmworkers", 1993 for an overview of the policy implications of recent ethnographic research on the composition of the overall farmworker population (i.e. the current farm labor force including both off-season and peak-season workers).

Table 5
Proportions of Farm Labor Force Identified in Census Data as belonging to another Occupational Group

Data Source Sample N	% Mis-Identified as not being a farmworker
Overall U.S. farmworker population National NAWS sample, N= 2,604	15%-39%
South Texas FLSS case study Weslaco, TX, N=56	19.6%
South Florida FLSS case study Immokalee, FL N=144	9.4%
Southwest Michigan CAW case study Berrien and Van Buren Cos. N=97	25.6%
Central Washington CAW case study Yakima Co. N=85	9.7%
California CAW case study Tomato workers -- San Diego, Fresno, and San Joaquin counties N=51	3.9%
California FLSS case study Parlier, CA N=120	12.4%

Table Notes

1 This analysis is comparable to the analysis of the effect of migration patterns on census enumeration of farmworkers. See notes to Table 3.

It is useful to consider variations in mis-identification rate of farmworkers in the context of migration patterns and overall economic strategies. The high rate of mis-identification of South Texas and Michigan farmworkers stems from the fact that the farm labor force in both these case studies includes relatively high proportions of workers residing in the U.S. and low proportions of transnational migrants. Living year-round in the U.S. increases some farmworkers' chances of being mis-identified because those workers who do not have a steady attachment to a single employer or group of employers

must find off-season work elsewhere, often in temporary or casual non-agricultural employment. Conversely, areas with higher rates of transnational migration have lower rates of mis-identification of farmworkers, because the transnational migrants who are, in fact, in the U.S. in March are likely to have returned to the U.S. because they have a job commitment from an employer. In Central California and Central Washington, for example, these March transnational migrants are those "core workers" employed in tree pruning (apples in Washington; grapes, peaches, apricots, and plums in Parlier).

The NAWS-based estimate of mis-identification is given as a range because the size of the dataset makes it more difficult to "resolve" each individual case with respect to successful identification by the census as was done in analyzing the case study data. Thus, the low end of the range of mis-identified farmworkers is based on the 15% of the NAWS sample who were actually working in non-agricultural employment immediately prior to census day. The range from 15% to 39% stems from the average unemployment rate of 24% in March, meaning that the actual mis-identification rate will, as suggested by the regional results from case studies, vary in relation to the likelihood that the last job prior to being unemployed was non-agricultural -- a fairly unlikely occurrence in areas with high winter labor demand (e.g. South Florida) but very likely in areas with weaker winter demand for agricultural labor.

The Cumulative Undercount as a Function of Interactions Among Distinct Components

In the preceding sections of this paper we have identified four distinct components of farmworker undercount and analyzed the available ethnographic and survey data which provide evidence of the mechanisms and extent of this undercount. Here, we provide a summary overview of how these components combine to generative a cumulative undercount even larger than the undercount attributable to each separate component.

Figure 7 summarizes these distinct components of the cumulative undercount of farmworkers. We provide estimates of the mean to provide an assessment of the overall national undercount, and of the high and low values to indicate the degree of variation to be expected from one community to another.

Figure 7
Cumulative National Undercount of Farmworkers

Component of Cumulative Undercount	Mean	High	Low
Undercount Components 1 and 4 Out-of-country migration Mis-identification	25%	40%	15%
UndercountComponents 2 and 3 Total HH Omission Partial HH Omission	40%	50%	35%
Estimated cumulative undercount (including component overlap)	60%	75%	50%

Figure 7 represents "best estimates" based on a number of considerations relating to interaction of undercount components. In general, it must be observed that the contribution of the various distinct components of farmworker undercount cannot be summed to yield a reliable estimate of undercount.

For example, out-of-country migration and mis-identification are (as discussed previously) are often inversely related. Thus, in Weslaco, TX, where the ethnographic evidence suggests a very low "out of country" rate and a very high "mis-identification" rate, the cumulative undercount attributable to both factors 1 and 4 is 26%. Conversely, the cumulative contribution of components 1 and 4 in Parlier, CA, a community with a high "out of country" rate but a lower "mis-identification" rate than Weslaco reaches only 38%. In Immokalee, FL, with a low "out of country" rate and a low "mis-identification rate", the combined contribution of both factors is only 14%.

Interaction of components 2 and 3, literally not being counted in the census, with components 1 and 4 (being out of the country on Census Day or being mis-identified) -- is not additive either. This is primarily because one of the sub-groups in the farmworker population most likely to be missed by the census (because of living in a low visibility household) is, also, a population likely to be in Mexico on Census Day -- i.e. the back-and-forth migrants. Thus, the regression model which predicts census omission as a function of social invisibility may already partially take into account the portion of this low visibility

population who essentially disappears from the statistical picture because they are not in the sampling universe (i.e. the United States).

However, it is possible to establish bounds on the degree of overlap between the migration component of undercount and the literal omissions component of undercount. Adopting the most conservative analysis of the overlap between migration and household omission, means that we can set the lower bound for cumulative farmworker omission as equal to the contribution of mis-identification and household omission (thereby assuming that all migrant farmworkers in Mexico in March are subsumed in the group predicted to be missed by the census on the basis of the logit model).

Using these assumptions, cumulative rates of omission in a town such as Weslaco, TX are in the order of 65% (assuming a "normal" total and partial household omission rate of 45% and using the actual mis-identification rate of 20%). In a town such as Parlier (assuming a "high" household omission rate of 60% and using the actual "low" mis-identification rate of 12%) we generate a 72% undercount estimate. In Immokalee, FL, with a low mis-identification rate (due to extensive winter work) and a high household omission rate due to the structural characteristics of the community (crowded housing, high ethnic enclosure, multiple non-English speaking ethnic groups, low farmworker educational levels, high proportions of very recent immigrants), then, there is likely to be a cumulative omission rate of about 75%.

While sampling and non-sampling errors related to census operations account for a much larger component of the cumulative undercount of farmworkers than do back-and-forth migration or "occupational migration" into non-agricultural jobs, the full extent of the demographic and socioeconomic bias in the 1990 census sample of farmworkers can only be accounted for by recognizing the contribution of various distinct factors to the cumulative undercount.

While there remain important questions regarding the interplay among different causes of the census undercount of farmworkers, the evidence is clear that there is a very substantial farmworker undercount, referred to here as a mega-undercount to distinguish it from the differential undercount examined in PES-based analyses.

While the recognition that almost two out of every three farmworkers in the United States is likely to be ommited from census data is a striking one, in our opinion the even

more striking observation is that the demographic and socioeconomic profile of this hard-to-count population is seriously skewed by a number of factors which bias the PUMS sample of farmworkers.

In the final section of this paper we examine the policy and program planning implications of the census undercount of farmworkers and briefly review high-priority research and practical options for rectifying the problem in Census 2000.

IV. Conclusions and Recommendations

The magnitude of the cumulative census undercount of farmworkers -- a national undercount of about 60% -- make it necessary to consider this phenomenon in different terms from the classical estimation of minority undercount resting on PES-based analyses. The finding that there is such a large national undercount of farmworkers and local "pockets" of even higher undercount appears to be robust since several different lines of evidence -- comparison of census data to alternative data sources, analysis of the skewed demographic profile of the farmworker population identified in census data, alternative enumeration case studies, and regression analyses based on the causes of undercount survey -- yield very similar estimates of the extent of the undercount.

Our finding of a 60-70% census undercount of farmworkers is, moreover, consistent with CSMR-sponsored ethnographic studies of undercount in other hard-to-count immigrant populations -- particularly since we recognize that the literal undercount of 40-60% (i.e. total and partial household omissions) is lower than the cumulative undercount (including mis-identification and out-of-country farmworkers) . However, the finding that the farmworker undercount is, despite substantial variations, a ubiquitous phenomenon tends to shift our conceptual model of hard-to-count populations. The undercount we observe among farmworkers does not support a model of undercount as a social phenomenon confined to isolated "pockets" of high undercount, a peripheral "glitch" at the margin of the statistical profile of the United States but as an endemic and somewhat inevitable phenomenon.

The issue of farmworker undercount differs sharply from the issue of minority undercount in that the farmworker population can only be identified on the basis of long-form data (specifically, occupation). In some respects, this makes farmworker undercount seem different from other facets of minority undercount, but, on the other hand, it may be

less unique. There remain issues unexplored in this paper as to the ways in which census operations related to the 5% long-form sample (e.g. long-form distribution procedures and followup, response errors, and sample creation) may contribute to undercount. Yet, while the composite undercount of farmworkers includes an analytic or definitional element (occupational mis-identification), similar problems arise even in terms of racial designations and information on ethnicity in census data (e.g. the many problems in correctly identifying different Hispanic sub-groups).

A key element in the evidence of farmworker undercount -- the skewed demographic profile of the farmworker population identified by the census -- relates, at the same time, to the consequences of census omission. The statistical picture of farmworkers in the United States is flawed not simply because the census has not enumerated many of the farmworkers in nation but, more fundamentally, because census data generates an incorrect and systematically misleading demographic and socioeconomic profile of the population. Discussion and debate surrounding minority undercount, by focusing primarily on the important issues of political apportionment and census-driven formula funding for various federal programs has overlooked the equally serious practical and theoretical consequences of systematic demographic and socioeconomic mis-information on undercounted populations.

What is fundamentally wrong with the census-based statistical picture of U.S. farmworkers? There are three fundamental problems. The first is that the skewed census profile of farmworkers (stemming not only from coverage error and response difficulties but, also, from farmworker migration and analytic problems) fails to show the degree to which the farmworker population is a transnational one. This problem cannot simply be seen as a technical one relating to the value of certain census variables (e.g. English-speaking ability). Instead it must be seen as an integrated problem -- the consequence of a "differential undercount" of certain sub-groups within a minority population.

The high levels of omission of transnational migrants from census data on farmworkers has direct and substantial relevance for both immigration policy and social policy. The remaining census-identified farmworker population appears to speak English better than is actually the case. There are less recently-arrived foreign-born persons, resulting in an over-estimation of settlers (i.e. immigrants) and an under-estimation of sojourners or back-and-forth migrants. The omission of the worst-paid and least stably employed groups of workers in the farm labor force (recently-arrived migrants with poor

network ties but also marginal female workers) serves to present an overly optimistic picture of economic conditions in the population.[52] By missing members of Mexican and Guatemalan linguistic and ethnic minorities, the newest networks of back-and-forth migrants, census data makes it more difficult to track the evolution of migration networks.

The skewed demographic profile of census-identified farmworkers, by underrepresenting young "pioneering" migrants, as well as many married long-term cyclical migrants from Mexico makes it difficult to rely on census data in medium to long-range analyses of either the dynamics or consequences of ongoing migration flows. These difficulties seriously handicap social program planning (since most program planners fail to grasp the implications of transnational communities in which wives live and children are raised in Mexico).The same difficulties confound policy analyses of the costs and benefits of migration (since back-and-forth migrants are sometimes socially isolated and do not use as many human services as settled farmworkers).

The second fundamental problem is that the underrepresentation of more peripheral "peak season" workers (both transnational migrants and occasional local, settled women) in census data seriously confounds estimation of farm labor supply. Census data (if the agricultural industry were to rely on it) would seem to indicate critical labor shortages when, in fact, all recent research shows chronic labor surpluses. Moreover, serious attempts to analyze census data on farmworkers would lead to serious puzzles about farmworkers' apparent ability to piece together a sequence of more work than would be suggested by any of the ethnographic or survey research on the population.

Third, farm labor data which represents primarily settled, stable, "core" workers makes it very difficult to confront one of the agricultural industry's leading problems, farmworkers' chronic underemployment and employment instability. The theoretical analysis based on the CUS model, the ethnographic alternative enumeration research, and the skewed demographic profile of census-identified farmworkers in relation to the NAWS and ethnographic research, provide strong indications that the socioeconomic profile of the census-identified farmworker population is, also, seriously skewed. It is exactly the sub-

---

[52] Because the adequacy of most farmworker households' earnings rest on the earnings of multiple workers in each household, accurate assessment of farmworker poverty requires high-quality data on earnings in relation to household size not simply mean values for earnings and household size. In the FLSS, Kissam and Griffith found that poverty rates were closely linked to type of family unit. This type analysis is another tool for testing the quality of census data on farmworker households.

groups among the farmworker population who are most likely to be missed (due to contributions by every component of undercount) who are most marginal in terms of work stability and earnings.

Finally, it must be observed that the census undercount of farmworkers is likely not to be entirely unique. While the farmworker undercount may represent an extreme case, to a substantial extent, census difficulties in enumerating transnational migrants and generating reliable occupational data on "occupational migrants", contingent workers in many labor markets, occupations, and low-wage industries will become more prevalent in the coming decade as U.S. occupational mobility increases and Mexico-U.S. economic and social linkages become still stronger.

In terms of research on differential undercount, the extensive evidence of farmworker undercount points to the inadequacy of PES-based estimates of the undercount of hard-to-count populations. Fein's theoretical analysis, our observations of the biased demographic skewedness of the population of census-identified farmworkers, and the ethnography indicate the existence of substantial variations within a single racial group (in this case, Latino farmworkers). The existence of significant differential undercount within a large minority population demonstrates that, at the very least, the current post-stratification design of the PES effort is inadequate.

The highly aggregated PES-based estimates of differential undercount by broad "racial" category (i.e. Blacks, Hispanics, and Asians) serve to undermine the increased social equity the analysis of differential undercount was intended to foster. We are fortunate that the extent of post-IRCA survey and ethnographic research on farmworkers makes it possible to demonstrate definitively the serious limitations of 1990 census data on farmworkers. Other hard to count ethnic minorities in the United States are likely to find it more difficult to overcome the illusion that census data provides a reliable profile of the demographics and socioeconomic status.

Recommendations

Here we briefly outline approaches for addressing each specific component of farmworker undercount. While some components (e.g. total household omission) contribute more to absolute undercount than others (e.g. partial household omission), all

components of undercount must be addressed in order to minimize sample bias and the resulting skewed demographic profile of the farmworker population.[53]

Obviously, each proposed solution should be considered in the context of overall national strategies for data collection and with attention to the costs of alternative strategies for improvement. Possible solutions include streamlining the decennial census with cost savings serving to fund more frequent, high-quality, special purpose, national surveys on special populations such as farmworkers. Such strategies must, however, be evaluated objectively and with full-recognition of the growing evidence that standard survey methodologies (e.g. the CPS) seem to generate doubtful quality data when used for research on non-standard populations such as farmworkers.

1. Addressing the migration problem -- Component 1 of the Undercount

A single-point sample is, inevitably, an inadequate sampling methodology for profiling a population which migrates annually. The component of census undercount which stems from the omission of migrants who are not in the U.S. on April 1 is dramatic evidence of that inadequacy. The single April 1 "snapshot" must be replaced with a "movie" of the migrant farmworker population if it is to yield reliable data on the numbers, distribution, and characteristics of migrant farmworkers.

Currently the National Agricultural Worker Survey, since it uses a rolling sample methodology and collects a full-year work history from all respondents provides an interim tool for generating information on migration patterns. In NAWS data, or in FLSS or CAW data, it is possible to generate a full-year "movie" of any respondent's migration over the course of the year and, by aggregating these pictures, secure a vastly improved picture of farmworker migration.

Ultimately, it is likely that adequate data on the farmworker population and valid data on migration will best be generated through use of a two-stage sampling methodology similar to that of the NAWS, focusing resources on more in-depth survey research efforts in high-probability areas for farmworkers. The CPS seems doomed to failure because the

---

[53] Time has not permitted an analysis of the possible effects of post-enumeration data editing and, in particular, allocations of values of variables made in preparing the PUMS files. Such editing and weighting procedures may or may not have magnified or decreased the effects of initial sampling errors. They should be examined carefully as part of further efforts to assess sources of error.

farmworker sub-sample is so small and because the CPS experiences the same sort of sampling problems the decennial census does. Because migration patterns -- both within the U.S. and across the Mexican border -- are likely to shift constantly, data collection efforts might well be shifted away from the decennial census toward an annual or bi-annual special survey effort.

While census data on immigrants is flawed, one attractive alternative might be to use 1990 census data to construct a first-stage sampling frame for a special "supplemental" survey effort by identifying communities with high proportions of immigrants. Although current data may omit large numbers of farmworkers (and other immigrants), what is known about migration dynamics indicates that immigrants will inevitably be concentrated in residential clusters to some degree. However, some problems remain, as the past decade has been one of vastly increased "pioneering" by migrant farmworkers and areas of the U.S. (particularly the Southeast) have new settlements of Latino immigrants which will not be easily recognized in 1990 census data.[54]

2. Addressing Total Household Omission -- Component 2 of the Undercount

Total household omission is the largest single factor in the farmworker undercount. Coverage improvement efforts designed to improve household identification may also have a positive impact on decreasing partial household omissions (particularly in "complex households").

An immediate step toward decreasing total household omission is to involve local residents more extensively in mapping activities. While low-visibility "unusual" housing units are not immediately evident to the general observer, the "syntax" of housing is well-known to local members of immigrant communities. Greater involvement of immigrant community members in mapping (and in the course of mapping building trust of the census system and motivation to respond) is an obvious, but important, effort.

---

[54] FLSS, CAW, and NAWS data show Latino farmworkers migrating into, and in some areas, settling in Southeastern states where, formerly, most agricultural labor was performed by U.S. born African-Americans. See (Amendola and Griffith, 1992) on migration dynamics in Georgia and South Carolina and Mines' 1988 GAO case study of North Carolina tobacco. Anecdotal information also tells of Latino settlements in areas such as the Mississippi Delta (personal communication, Ken Light), Alabama (Weslaco FLSS data), Tennessee (Michigan CAW data).

Mail address lists and commercial address lists present almost the worst possible way to find farmworker households. On-the-ground mapping is the only substitute. This mapping should be understood to include not only identification of physical structures but also coding to assess the likelihood of multiple social groups within a housing unit (e.g. illegally subdivided apartments, garage and toolshed residents, patio campers). Ideally, local, bilingual/bicultural census mappers should subsequently be involved in followup and face-to-face enumeration.

We assume that non-return of mailed census forms plays an important role in total household omission. We are not familiar with the operational details of census followup but it is likely that reliance on mailout-mailback survey methods in which the mailed form is a) the long-form and b) the English-language long form swamp followup operations in areas with high densities of farmworkers, few of whom speak, and even less of whom read and write, English. High-density non-English areas should receive targeted mailings of native-language (in the case of farmworkers, Spanish-language) census forms. However, census operations should be designed with the expectation that even with Spanish language forms, the need for face-to-face enumeration will be high.

Forms simplification will also play an important role in decreasing total household omission. As reported elsewhere (Kissam, Herrera, and Nakamoto, 1993), Hispanic respondents with less than an elementary level education -- the majority of farmworkers -- find it extremely difficult to complete the census form even in Spanish. Since farmworker data derives from the long-form, the difficulty is even more extreme than with the short-form.

Where use of native language forms is infeasible (e.g. Kanjobal, Mixtec communities), special outreach projects should be established. Zabin, Runsten, and Garcia have used snowball sampling methodologies very successfully in their research on Mixtec settlement and similar efforts by the Census Bureau are clearly feasible and affordable.

Even use of native-language forms and forms simplification are unlikely to overcome many response difficulties encountered by low-literate Hispanic respondents such as farmworkers so it will be essential to provide a balanced mix of face-to-face enumeration and forms completion support -- from local community providers.

3. Addressing Partial Household Omission -- Component 3 of the Undercount

For farmworkers, partial household omission is only a secondary cause of undercount. However, there is likely to be systematic omission of the most peripheral social groups in the housing unit -- transient boarders, relatively distant social sub-groups, or recently-arrived undocumented workers. Consequently, efforts to decrease partial household omission deserve attention, as much to decrease sample bias as to improve overall enumeration.

A number of improvements are needed in census form instructions relating to household inclusion/exclusion rules (Kissam, Herrera, and Nakamoto, 1993). However, additional measures are needed. A particularly important emphasis in the specific context of farmworker enumeration would be to expand and clarify the concept of "usual residence" and the desirability of enumerating all persons in a household irrespective of immigration status. Census outreach and promotion efforts should also specifically address the situation of large, complex households and the correctness of including all sub-groups in a single dwelling, even those which are socially distant. Ideally, census forms should include exhortations to consult as needed with other household members in responding to the census long-form (since in large, complex households, the respondent may know very little background information about co-tenants).

4. Addressing Occupational Mis-Identification -- Component 4 of the Undercount

The statistical problems inherent in using current data on agricultural data and farmworkers , as we argue in our initial review of various data sources, extend well beyond the decennial census. In part, these stem from inconsistencies in legislatively mandated definitions, from lack of inter-agency coordination, and, in part, from limitations of current data collection methodologies and operations.

Yet another source of difficulty stems from the inadequacy of analytic concepts developed in previous social eras to encompass current social and economic realities. Difficulties with SIC (and Census) industrial and occupational classifications stem in part from a society in which farming was a local, simple, small business activity. Agriculture has become, during the second half of the 20th century a corporate activity conducted

within a complex regulatory framework of federal and state regulations, and business linkages and joint ventures, in a national and international commodities market.

In this context, the problem of correctly identifying farmworkers from census data as a function of macro-scale social change . Workers surveyed in Census 2000 will even more than today have worked in multiple occupations and industries during the course of their worklives and, most relevantly will more often have worked in multiple occupations and industries during the course of a single year.

It should not be surprising that workers in low-wage immigrant-dominated industries and occupations should have the most unstable employment and experience high levels of "occupational migration" among a cluster of occupations and industries to which they have access. Farmworkers are a special case but not a unique case in this regard. Consequently no single "one exposure snapshot" (listing of one occupation during one sample week) is likely to provide a valid measure of the economic experience of farmworkers or many other immigrant workers throughout the course of the year.

Some federal programs serving migrant and seasonal farmworkers, whose funding is based on Census of Population (COP) data, believe that a slight modification of census long-form questions could make the COP a valuable source of data on farm workers. Their proposals have been for the COP to ask respondents what amount or percentage of their earnings in the year preceding the COP were from farm work. In this way, a respondent not employed as a farm worker in March but with farm earnings during the previous 12 months, can be identified on the COP.

This change in the Census questionnaire would not provide a look-up source of data on the number and distribution of migrant and seasonal farmworkers and dependents for two reasons. First, knowing that a worker had farm earnings during the previous year does not distinguish migrant workers from other farm workers. Amending the Census questionnaire would provide useful data on farm workers, but , most importantly it will not produce the data on number of migrant farmworkers, their migration patterns, or a reliable information on their geographic distribution during different points of the year.

We propose a broader, more generic solution to the issue of occupational classification, namely a query in Q. 29 which a) uncouples occupational designation from occupation during a single sample week, b) allows a single respondent to be coded as

working in one primary and, at least two secondary, occupational categories. and c) secures data on part-time vs. full-time labor force participation in each occupation.

Thus, a revised Q. 29 on occupation might read as follows:

Q. 29 What was the main kind of work you did during most of last year (1999)? Was this full-time work (40 or more hours a week) or part-time?

_____ [primary occupation} Δ Full-time? Δ Part-time?

Q. 29a Did you do any other kind of work during last year? Is so, what? (List up to two other kinds of work you performed.)

_____ [secondary occupation} Δ Full-time? Δ Part-time?

_____ [secondary occupation} Δ Full-time? Δ Part-time?

What this formulation of the question does is provide a) relatively reliable rank ordering of multiple occupational experiences during the year, b) basic data on economic strategies for multiple job-holders. The primary disadvantage of the re-formulated question is that occupational categorization is less clearly anchored to a specific time frame and subject to possible problems of recall.

In actuality, occupational experience is so fundamental a social datum that we would not expect recall problems. Our experience in interviewing farmworkers with large numbers of successive jobs in different crop tasks and movement in and out of agricultural work is that specific time periods worked in a given job or task present recall problems and, also, that respondents have difficulty in recollecting exact sequence of very short-term jobs, but that recollection of the overall pattern is not very problematic. We consider a survey strategy of gaining precision in classifying one occupational experience among many at one arbitrary point in the work year (work performed during the last week of March or last previous job) to be a poor trade-off when weighed against the pervasive reality that America has increasingly less workers who remain in a single, stable job throughout the course of the year.

Our expectation would be that census occupational categorization revised along the lines proposed here would, in fact, continue to mis-identify a small proportion of very casual farmworkers (e.g. a woman in a South Texas farmworker family who combined work as a seamstress, work in a vegetable packing plant, and week-end waitressing, as

well as picking melons for several weekends). Our proposed question revision would, however, address the data needs not only of those of us interested in the farm labor force but generate a broader and more accurate picture of U.S. workers' labor market experience.