California. University. Institute of
Industrial Relations (Berkeley)

Oakland Mobility Survey: Summary of Methodology

by

William Goldner

INSTITUTE OF INDUSTRIAL RELATIONS

UNIVERSITY OF CALIFORNIA

Berkeley

INTERVIEWER'S GUIDE

LABOR MOBILITY STUDY

March, 1949

INSTITUTE OF INDUSTRIAL RELATIONS

You are an interviewer! In the study of labor mobility you are the crucial link. We have hypotheses which have been suggested by experts from all branches of social science. The interview schedule with which you are by now familiar was drawn up by specialists and run thru two pre-tests. Five months of hard work have gone into the interview schedule. It is up to you to make or break the study. If you are conscientious interviewers and follow instructions we will have a study that will be of great value, both from the standpoint of economic and social theory and from the practical conclusions that can be drawn from it.

Interviewing is interesting. No matter how many interviews you may have given you will always find some new situation which is not covered in the instructions. All a good interviewer needs is to know the objectives of the questions, follow instructions where applicable (and this will be most of the time), and in cases not covered use common sense. No amount of book-larnin' will compensate for the latter. The requirements for a good interviewer are simply common sense, an ability to talk (just enough to ask questions), to listen, and an interest in people. The fact that you are in the university and have volunteered (under varying duress) to interview assures of all the latter factors....and we're taking your common sense to trust!

The interviewing is being conducted by students from psychology, sociology, and social welfare. These written instructions form a basis for equating the procedures for all of you with slightly different backgrounds and interests. Listed below are ten general rules for you to follow.

1. PRACTICE YOUR INTERVIEW TECHNIQUE IN ADVANCE UNTIL YOU ACHIEVE SMOOTH AND TECHNICALLY CORRECT PERFORMANCES.

You will all have given the interview schedule at least twice before doing any actual interviewing. If you know your schedule and can go through it easily and accurately it will increase your own self-confidence and make it easier for the interviewee to understand you. This will result in more accurate data -- and with the errors that will inevitably creep in we can't afford to miss any bets.

2. MAKE EVERY REASONABLE EFFORT TO LOCATE AND COMPLETE AN INTERVIEW WITH EACH OF THE SPECIFIC INTERVIEWEES ASSIGNED TO YOU.

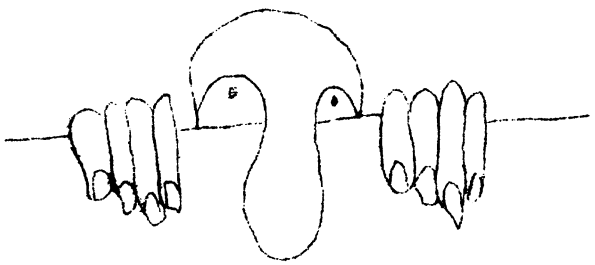
In area sampling you will interview one member of an assigned dwelling. Since he will be notified in advance he will be expecting to be inter-

viewed. If he isn't home call back the next time you are in the neighborhood. If he is pressed for time on the first contact, make an appointment. If you can't find him in or get an interview tell your interviewing supervisor and get further instructions from him as to what to do. It is most important that we get interviews with the assigned interviewees. We have gone to a great deal of trouble in making detailed maps of Oakland, sampling our blocks randomly, and looking up each dwelling unit so we will have an accurate cross-section of the areas in which we are interested. All of this labor will be in vain if you do not get your assigned interviewee.

3. KEEP YOUR CONVERSATION WITH THE INTERVIEWEE AT A MINIMUM UNTIL AFTER THE INTERVIEW IS COMPLETED.

This is extremely important. Many of the interviewees may have no strong opinions about some of the questions you ask. In such situations they may be amazingly responsive to the slightest clues you offer. If you express any opinion on the results found so far, what you think might be found, or even that things are rough all over they are apt to give it back to you in the answers. If we wanted you to interview yourself we wouldn't send you to the outskirts of Oakland to do it! If it is necessary to talk to the respondent to increase rapport or reassure him keep on some neutral subject. The weather is a reliable standby but don't bring in its effect on work or the comparative merits of California climate (remember the questions on geographic mobility).

4. CONDUCT YOUR INTERVIEW ALONE WITH YOUR INTERVIEWEE.

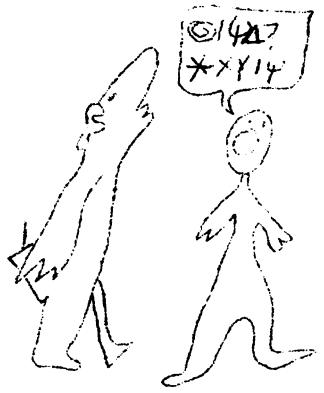


If it is at all possible conduct your interview in a place where you will not be disturbed. If other people are around they should not be in easy earshot. The addition of a third person may have all sorts of effects on the replies you receive. A recent study at the University of Minnesota showed that many wives didn't know their husbands income was as high as it actually was. We don't want to have answers which reflect any bias due to the presence of third parties; on the other hand, we don't want to break up any homes either. In interviewing two's company, three's a crowd!

5. READ ALL QUESTIONS VERBATIM TO YOUR INTERVIEWEE.

It is extremely important that when we analyze the answers we are evaluating the answers to the same questions. Don't rely on your memory, you're human! Read the question. It has been conclusively shown in studies on public opinion polls and surveys that slight changes in the wording of a question produce important changes in the responses to a question.

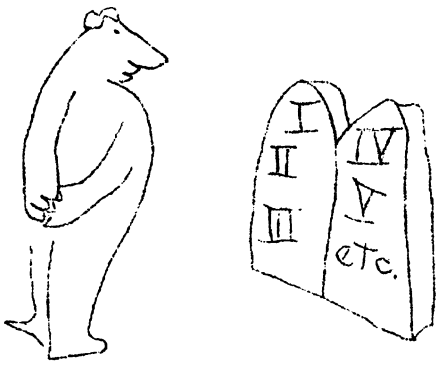
This is especially important on open end questions. If the interviewee doesn't understand a question re-read it. You may change your inflection or modify your voice but read the question over. If his response to the question isn't clear to you in light of the objective of the hypothesis being checked then probe to get a more explicit answer.



6. RECORD YOUR INTERVIEWEE'S RESPONSES TO OPEN END QUESTIONS VERBATIM: PUT DOWN WHAT HE SAYS (IN HIS EXACT WORDS).

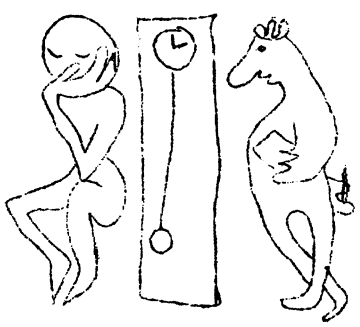
This is perhaps the hardest of the instructions to follow. It is also one of the most important. We don't want you interviewing you. As far as possible write down verbatim exactly what the interviewee says. Any editing that you do reflects the things that you think are important -- not the interviewee. Essentially asking the same question (as in #5 above) is presenting all interviewees with the same stimulus. In any scientific study the stimulus has to be the same and the response also has to be fully recorded or important data will be missing.

We know that with certain interviewees you will not be able to write down everything he says. It is permissable to ask him to slow down so you can write a more complete account. Don't paraphrase. If you can't get everything down leave out connectives, minor qualifying terms, and obvious disgressions. By using abbreviations you can add a lot of writing time for the important independent concepts and major qualifying terms. It is important that you write down all phrases indicating emotional reactions verbatim.



7. PRESENT THE INTERVIEW ITEMS TO THE INTERVIEWEE ONLY IN THE AUTHORIZED ORDER OF PRESENTATION.

It is basic gestalt psychology that the context determines the meaning of an item. By asking the questions in order (one which has been set up after experience with previous interview schedules) we focus attention on different aspects of the interviewee's experiences at different times. We have experimented with the order in which the questions have been presented in order to give a logical continuity to the questions. So there is no reason for skipping around and changing the context in which each question is asked.



8. ALLOW YOUR INTERVIEWEE PLENTY OF TIME TO RESPOND TO EACH QUESTION.

As students you live in a highly verbal atmosphere. Most of your waking time is taken up in either verbal or written communication of one sort or another. You can express ideas with varying degrees of fluency on subjects from the economic determinants of

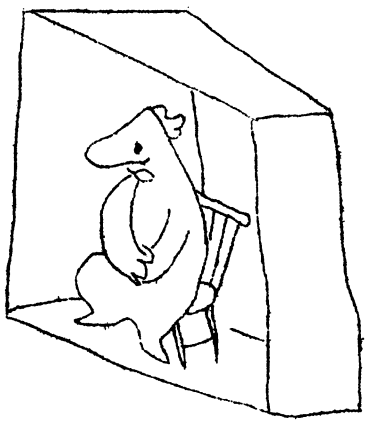
the Peloponnesian War to Cal's football prospects next fall. Remember, however, that some of your interviewees may live in a very non-verbal atmosphere. They may grunt at their wife three times a day, work at a job which requires purely manual dexterity, and just never feel any great urge to say anything to anybody. If they aren't used to expressing themselves it will take them a while to respond in a situation which they haven't had any practice.

In general the interviewing should proceed at an easy to moderate conversational gait. Long pauses are awkward and unnecessary. You can nearly always tell when an interviewee has finished a response, and when he hasn't, give him all the time he wants in which to formulate his thoughts.

9. ACCEPT YOUR INTERVIEWEE'S RESPONSES AS THEY COME; WHATEVER THEY ARE; BUT SHOW NEITHER APPROVAL OR DISAPPROVAL OF ANY OF THEM.

This relates to a subtle biasing factor. Just as your interviewee responds to any ideas which you may express, he also responds to secondary cues of approval or disapproval. Most people have a very hazy idea of scientific objectivity in the social sciences; they tend to think that you are out to get certain results. Since they are good folk and want to help you out they cooperate by giving the answers they think you want.

It is practically second nature to most of us, when we hear something with which we agree, to nod slightly, to smile, to grunt appreciatively, or otherwise show our approval. Your interviewees are people who respond to such cues and may omit things if you give subtle indications of disapproval or expand in a topic which he thinks you approve quite beyond the realm of truth. This doesn't mean that you should make like the great stone face; just that you should be aware of and minimize all expressive cues which might tend to bias the interviewee's responses.



10. REMEMBER, YOUR ONLY ACCEPTABLE POSITION AS AN INTERVIEWER IS ONE OF COMPLETE OBJECTIVITY, AND COMPLETE, UNDEVIATING IMPARTIALITY.

To get absolutely comparable data from each of our interviewees, there should, ideally, be identical stimuli presented to them in the form of exactly the same questions by identical interviewers in a standardized situation using identical procedures. If you follow instructions we will have the same questions and the same procedure. We can't do much about standardizing every home in Oakland! And we can't fit all our interviewers into a mold so they will all be alike. If you do follow instructions and are careful not to bias the interviewee's responses in any way we can minimize the differences arising from different interviewees.

We don't know what our final data will show. We have a number of hypotheses which we will test and accept or discard on the basis of the data which you will bring in. It is extremely importnat that you bring in data which is accurate so we, too, can make statements which are objective and impartial.

SPECIFIC INSTRUCTIONS

CLOTHING.

You are representing the Institute of Industrial Relations at the University of California. This sounds very impressive and your interviewees will expect you to look like a representative of the Institute. Men interviewers should wear a shirt with a collar and tie, and preferably a suit or coat and trousers. Women interviewers should dress as if they were ready to be seen in public with aforementioned male interviewer. Not too fancy, just business like.

SELECTING THE INTERVIEWER.

You will be given an Interviewer's Control Sheet which will specify a certain segment of a certain city block (for example: the east side of 69th Avenue between East 14th Street and Rudsdale Street), and will list all the dwelling units on that segment. INTERVIEW THE PRINCIPAL WAGE EARNER IN EACH AND EVERY DWELLING UNIT EXCEPT one corner lot, as described further below.

The principal wage earner is simply the individual who is the economic mainstay of his household. In most cases, he will be easy to identify. In situations where it is not obvious who is the principal wage earner, it is essential to select the person to be interviewed according to a fixed procedure. Observe the following rules:

1. In a household composed of a working husband and a wife, with or without children, always interview the husband, even though the wife may also be employed.

2. The person normally the principal wage earner may be unemployed -- interview him if he has worked at all during the past three months.

3. The person normally the principal wage earner may be out of the labor market due to illness or disability -- interview him unless he is going to be permanently or indefinitely unable to work.

4. If there are no working members in the household, interview the male member with the most recent record of employment within the past five years. If there is no such male, interview the female with the most recent record of employment within the past five years. If the household contains no such person, refer the matter to your supervisor.

5. Some households will be composed of unrelated persons, all or several of whom may be working (e.g., working girls sharing an apartment). In such cases, interview the person whose family name is first alphabetically. This is very important. "Home-bodies" who are usually found at home may reflect entirely different factors in their work histories than those who are frequently away from home (and therefore harder for interviewers to reach).

OMITTING ONE CORNER LOT

Since you are interviewing principal wage earners in a street segment representing one-fourth of a city block, it is necessary to include only one-fourth of the corner locations. This means that one of the two corner locations on each sample block segment must be omitted from the survey. Do this in the following way:

1. If you are working the East side of a street, omit the South corner.

2. If you are working the West side of a street, omit the North corner.

3. If you are working the North side of a street, omit the East corner.

4. If you are working the South side of a street, omit the West corner.

Important: It is the corner location that is to be omitted, not necessarily the last house on the street. If the indicated corner location is a vacant lot or a non-residential building, then all the dwelling units on the street must be visited and an interviewee selected from each.

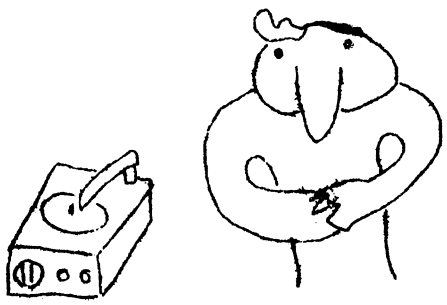
Note also: The foregoing procedure of omitting a corner location applies only to rectangular-shaped blocks. If a block is of irregular shape, omit nothing.

CONTACTING INTERVIEWEES.

Since we are sampling the working population this means that they will be free only in the evening and on weekends and holidays. This limits the actual contact time available. If the interviewee is not home on the first time you call try to discover when he will be home. If he is busy make a definite appointment and keep it. Get your interview. Most people are glad to be interviewed and like to talk. A few will be a little harder to persuade. If you have any trouble either in contacting or conducting your interviews check with your interviewing supervisor. Keep a record of all your contacts, attempted contacts, and refusals so you can show your supervisor the exact reason why the interview has not been obtained. Use the Interviewer's Control Sheet for this record.

INTRODUCING YOURSELF.

Introduce yourself by name as an interviewer from the Institute of Industrial Relations at the University of California. You will have a letter of introduction to aid in establishing your identity. Since they may have varying stereotypes of students don't introduce yourself as a student unless they specifically ask in which case you will of course admit the fact.



INTRODUCTORY SPIEL.

This is a problem. You should not launch into an imitation of a phonograph record with a wooden, mechanical speech. Yet it is essential that all respondents have the same initial set toward the interview so the results will be comparable. You will find wide differences in the amount of information interviewees will want before they will accept the role of being interviewed. Some will interupt you as soon as you say, "I am an interviewer" and commence giving you their life history and that of their ancestors back to the Mayflower. Others will try to cross-examine you and your political and social background, the policy of the Institute, how many communists do you know, etc. In such cases rephrase the following instructions and tell them about the Institute. Do not go into any detail about the nature of the questions, what hypotheses we are testing, etc. We can't afford to bias the interviewee's replies. Tell them that you can't give them any details of the study before you start since it may affect their answers. Assure them that after the interview is completed that you will be glad to answer any questions that they might have about the over-all objectives of the study. In this event it is best not to be too specific since you will be interviewing all households in a block segment and neighborhood discussion of the study may bias the responses of persons to be interviewed later.

The following form is designed as a model and you should tell all your interviewees everything that is contained. They may be willing to talk as soon as you

introduce yourself but, for example, if they aren't assured that all the information is confidential you might get slightly different answers. You may rephrase certain statements but be certain that you don't change their meaning. We suggest that you memorize the following form and then in actually talking to the interviewee, modify it in accordance with the feel of the situation.

HOW DO YOU DO. I AM _____ _____ FROM THE INSTITUTE OF INDUSTRIAL RELATIONS AT THE UNIVERSITY OF CALIFORNIA. YOU SHOULD HAVE RECEIVED A LETTER TELLING ABOUT THE STUDY WE ARE DOING.....(Interviewee will either indicate that he has or if not you will give him a copy of the newspaper story and/or a duplicate form of the letter sent out).....WE ARE INTERVIEWING WORKING PEOPLE IN SELECTED AREAS OF OAKLAND. WE ARE INTERVIEWING ONE PERSON IN EACH HOUSEHOLD. IN ORDER TO INTERVIEW THE RIGHT PERSON I HAVE TO FIND OUT HOW MANY PEOPLE HERE ARE WORKING...(if you already have the primary wage earner continue the spiel. If not get the primary wage earner and start all over again).....OUR INTERVIEWING IS CONCERNED WITH FINDING OUT WHAT PEOPLE THINK ABOUT WORK. ALL MATERIAL IS CONFIDENTIAL. NO ONE WILL KNOW WHO YOU ARE AND NO ONE OTHER THAN THE PEOPLE MAKING THE STUDY WILL SEE THE ANSWER YOU GIVE. ALL YOUR ANSWERS WILL BE HANDLED STATISTICALLY SO WE CAN MAKE SOME OVER-ALL STATEMENTS ABOUT THE WAY PEOPLE GET JOBS, WHAT THEY LIKE ABOUT THEM, AND WHAT THEY DISLIKE ABOUT THEM. THIS MATERIAL WILL BE PUBLISHED AFTER THE STUDY IS COMPLETED AND YOU WILL BE ABLE TO FIND OUT ABOUT IT IN THE NEWSPAPERS AND SEE HOW YOU COMPARE WITH OTHER PEOPLE.

AFTER THE INTERVIEW IS COMPLETED YOU SHOULD FEEL FREE TO ASK ANY QUESTIONS YOU WISH ABOUT THE INTERVIEW. IT IS IMPORTANT THAT YOU ANSWER ALL THE QUESTIONS AS FULLY AS YOU CAN SO WE WILL HAVE ACCURATE INFORMATION WITH WHICH TO WORK.

INSTRUCTIONS ON SPECIFIC QUESTIONS

No. 1. This is placed at the beginning of the schedule so that you can learn the household composition and select the right person for interview. List in this form all persons in the household, and report the sex, age, and labor force (L.F.) status of each person.

Identify each household member, not by name, but by his relationship to the principal wage earner, such as wife, son, daughter, father, neice, etc. If you find boarders or roomers in the household, report them as boarders or roomers.

In the column headed, "L. F. Status", enter for each household member a code number designating his labor force status, as follows:

Code	Status
x	Under 14 years of age (all persons under 14 to be assigned this Code)
1	Employed, full time
2	Employed, part-time
3	Unemployed and seeking work.
	Not employed and not seeking work (not in the labor force) because:
4	Engaged in own home housework (housewives)
5	In school
6	Unable to work
7	Retired
8	Other reason (explain)

Note: If you are able to identify the principal wage earner without filling in all the foregoing information, use your own judgment on whether to get the household information at the start or postpone it to the end of the interview. Since people are sometimes touchy about giving personal information to a stranger, it is often desirable to postpone such questions to the end of the interview. If you should postpone these questions, be sure not to forget them. They are extremely important.

N. B. Question one is the ONLY question may be moved out of order. All other questions must be asked in order.

No. 2. The first full time job after leaving school means what it says; after leaving school. However, if a person has completed high school, then has interspersed periods of employment with periods of higher education, start the work history after high school.

No. 9. Note that this question comes immediately after the question (No. 8) on preparation for a particular kind of job, in the middle of page 2 of the schedule. (The form for No. 9 may be stapled at the back of the schedule, but it should be asked as No. 9 in the list.

Fill out the first 8 columns in chronological order from first to present job. Then go back and ask 9 and 10 for each job. If you run out of room use the back of the page. Since the employment history forms the backbone of the interview it is important that you get one which is as complete and accurate as possible. Be sure to account for all periods of unemployment and all periods when respondent was out of the labor force.

No. 24. Type the listed ways of finding jobs on a white 3 x 5 filing card. Show it to the interviewee so he can look at it and tell you which ways he has used. You will put an X beside each one which he says he has used. Since some interviewees can't read you should read them off one after the other to him.

No. 46a. Get specific information on this question. The reply "farmer" for instance might mean anything from a share cropper to a plantation owner. We must have more specific information to enable us to make a better estimate of the socio-economic status of the interviewee's parents.

No. 56. Run down the list of organizations first and check off the ones which the interviewee belongs to. Then go back and get the rest of the information for each organization. This information is important for testing our hypotheses about community integration so get a complete record of group memberships.

USE OF _____. Put a big X over the appropriate response.
Yes or No

USE OF PROBES. This is a point which allows you as an interviewer a great deal of flexibility. The best probes are the least directive. Often a simple "why", "what do you mean", "yes", or even an expectant attitude with pencil poised are the most effective. It is essential in such a study as this in which we are interested in uncovering motivations that a simple non-comittal statement in response to an open-end question be probed. In many such cases you can put a "why" in front of what he says and give it back to him for further explanation. DO NOT ASK LEADING QUESTIONS. Each of you will have favorite probes. Just remember to keep them simple and to indicate on the interview what you used.

TERMINATING THE INTERVIEW

At the end of the interview thank the interviewee for his cooperation. We will be interviewing in a thousand Oakland homes and we want to leave each and every one of them with a favorable impression of the University. In a great many cases you might be the only person with any connection with the University that your interviewee has ever met, in such a case he will judge the University on the basis of your conduct. In the event some of the questions create any tension, it is a good idea to stop and chat for a few minutes after completing the interview. Be tactful and you will leave the interviewee with the impression that he has made a real contribution to the study of labor mobility.

[Berkeley] Corrected Copy August 1954

OAKLAND MOBILITY SURVEY:

SUMMARY OF METHODOLOGY

by

William Goldner...

[Corrected Copy]

This is a working document, which should prove useful to members of the Institute Staff who have occasion to work with the Oakland Mobility data. It may eventually form an introductory chapter or appendix to a monograph based on the data, in which case it will probably be subjected to minor revision and to some condensation.

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TABLE OF CONTENTS

*Section V will be completed when further tabulations of the data are made.

TABLES AND CHARTS

SPECIFICATIONS, DESIGN AND CHARACTERISTICS OF THE OAKLAND LABOR MOBILITY STUDY

I. Introduction

Standing behind all of the tabulations and analysis of this study are the methods, concepts, and procedures by which the data were obtained. This chapter describes the methodology of the survey in order to allow the reader to evaluate the findings. For not all variations in a sampling survey are measured by the sampling errors; qualitative and judgmental aspects of the survey contribute to the variability of the data in an amount that may exceed the magnitudes of the sampling variability. Furthermore, these qualitative factors are essentially unmeasureable and can only be evaluated by non-quantitative standards. Non-sampling errors are decreased by testing and refining the design of the schedule, by standardization of instructions to interviewers and coders, by intensive interviewer training, by control of the day-to-day interviewing workload, by evaluation and correction of schedules as they are turned in, and by many other administrative devices. This chapter therefore provides estimates of the measureable sampling errors and also describes the material relevant to an appraisal of the unmeasureable variability.

The Oakland Labor Mobility Survey was planned as a major portion of a more general and intensive study of the San Francisco-Oakland labor market. The overall plan provided for specific studies in each of the following areas:

1. A detailed survey of employer policies in the area of industrial relations and personnel management.

2. An analysis of the role of employers' associations and multi-employer bargaining.

3. An intensive study of the characteristics and mobility of "marginal" workers -- "marginal" in the unique sense that they had special difficulty in obtaining employment.

4. A study of the mobility of the "typical" or "normal" types of workers in the local labor force.

5. A pilot study of labor mobility survey methodology to aid in the planning of more comprehensive surveys to be conducted in the local labor market and in other areas of the country.

All of these studies have been substantially completed and are published or in the process of publication. This survey accomplishes the purposes mentioned in Items 4 and 5 above.

An additional concept underlying the planning and execution of these studies was the notion of an inter-disciplinary approach. The above-mentioned studies, and particularly the Oakland Labor Mobility Survey, were planned by cooperating teams of experts from several disciplines. The survey was a trial run in coordinated research among the several social sciences, and many of its special characteristics are directly traceable to these influences.

II. Purposes of this chapter

The specific purposes which this chapter seeks to accomplish are several. First of all, it outlines the planning and hypothesizing that take place during the survey's gestation period. Then, second, it describes the design of the sample that was used. Third, some of the relevant general characteristics of the population surveyed are described. Fourth, the survey concepts and results that are comparable with the population data available are presented and evaluated. Fifth, the sampling errors of the survey are estimated. Finally, an appraisal of the errors arising from non-sampling causes is made.

III. Planning the survey

The original planning of the Oakland Labor Mobility Survey was the function of a special committee of staff members of the Institute of Industrial Relations. This committee, selected to implement the interdisciplinary objectives previously mentioned, consisted of:

Clerk Kerr, Director, Institute of Industrial Relations
Davis McEntire, Associate Professor of Social Welfare
David Krech, Professor of Psychology
Seymour M. Lipset, Assistant Professor of Sociology

In addition, several junior members of the Institute staff were participants in the planning stages. These included:

Richard Christie, Psychology
Margaret Schleef, Economics
Virginia Taylor, Directors' Office
Jane C. Record, Economics

Starting in the early part of 1948, this committee met regularly and developed hypotheses toward which the survey was oriented. The hypotheses, originally written down in great detail, may be summarized as encompassing the following major subject areas:

1. Identifying the several types of labor mobility and their interdependence.

2. Investigating the relationship of differential rates of mobility with workers' sex, age, socio-economic status, and to other demographic characteristics.

3. Evaluating the role of economic incentives in inducing mobility.

4. Appraising the importance of the worker's first job to his subsequent work career.

5. Comparing voluntary choice and involuntary compulsion in job selection and employment separation.

6. Studying the interrelatedness of the various segments of the workers' overall occupational career.

Based on the detailed hypotheses, an impressive questionnaire was designed, tested, and twice revised in the light of findings from pilot surveys. These surveys were conducted in the Berkeley-Albany area adjacent to the University of California. About fifty interviews were made in each of the pilot studies. The questionnaire which resulted from these revisions is reprinted in the Appendix.

At the conclusion of the planning stage of the survey, several other people began to devote a substantial portion of their time to the survey. These included:

Lloyd Fisher, Professor of Political Science
Mason Haire, Associate Professor of Psychology
F. T. Malm, Assistant Professor of Business Administration
William Goldner, Junior Research Economist, Institute of Industrial Relations

As the attrition of academic turnover took its ~~toll~~ Toll, replacements and additions to staff members mentioned above were appointed. They were:

Reinhard Bendix, Associate Professor of Sociology
Margaret S. Gordon, Research Economist, Institute of Industrial Relations

Thus, over the whole period of the survey, a very large team of planners and analysts have participated in the preparation of the survey; its execution, and the subsequent analysis.

The product of the survey was to have included articles in at least the following general subject areas.

1. First job
2. Geographical mobility
3. Labor market aspects of mobility
4. Social mobility
5. The mobilities of special segments of the labor force
6. Job satisfactions
7. The role of leisure in labor force participation

A. Problems of Concept

In the pilot studies, the interviewers became aware of many ambiguities in the phrasing of questions, of areas of questioning that were beyond the scope of inquiry, and of conceptual definitions that were ill-defined and unspecific. Out of the suggestions of the pilot study interviewers and from the analysis of the responses to these schedules came more clearly formulated definitions. At the same time, the preliminary planning of the coding and tabulating for the survey exerted some influence on the concepts, too. The necessity of establishing clear, mutually exclusive categories for codification, segregation, and analysis, the limitations exerted by turning to established codes and classifications for many of the items, and the sheer bulk of the coding problem, all pointed to the need for an articulated, simple conceptual apparatus.

At the same time, the diverse interests of the several planners, each oriented to the viewpoints and problems of his own discipline, exerted influence toward cumulative proliferation of concepts. It was equally clear that the respondents and the interviewers would be hard pressed to ask and answer questions sensibly if the nuances and subtleties of interdisciplinary differences were maintained. The result of these pressures for and against overall standardization led to compromises which will be apparent in the following itemization of conceptual definitions.

1. Principal Wage Earner: The principal wage earner in each household was designated as the respondent in the survey. The principal wage earner was the individual who, normally and regularly, was the economic mainstay in the household. Special problems in determining the principal

wage earner were handled as follows:

a. In a household composed of a working husband and wife, with or without children, the husband was the principal wage earner, even though the wife may also have been employed and even if she was earning more than the husband at the time of the interview.

b. In cases where the person normally the principal wage earner was unemployed at the time of interview, he was to be considered the principal wage earner if he had worked at all in the previous three months.

c. Persons temporarily not working because of illness or disability were not to be disqualified from being principal wage earners.

d. For households in which there were no working members, the male with the most recent work history in the previous five years was to be considered the principal wage earner. If no male fitting this description was present in the household, then the female with the same work history was interviewed. If neither a male nor female member of this description was present, the household was considered to be out of the sample.

e. For households composed of unrelated persons all or several of whom may have been working (working women sharing an apartment, for example), the person whose family name was first alphabetically was considered the principal wage earner.

2. Labor force status: Each member of the household was classified with regard to his labor force status in the process of determining whether he was the principal wage earner. Active members of the labor force were those household members 14 years of age and over, employed in part-time or full-time work, or unemployed and seeking work. Persons 14 years of age and over not in the labor force were those engaged in their own housework, in school, unable to work, or retired. It should be noted that principal wage earners as defined in 1.d. above included some retired persons.

3. Job, occupation: The questionnaire was framed on the assumption that a job was self-evident to the respondent. Only during the course of

the survey was it discovered that there were some significant variants in the concept.

A job was considered to be the continuous period of employment with a single employer, during which no change in occupation, industry, or locality was reported by the respondent.

A job card was made out for each job, for each period of unemployment, and for each period out of the labor force between jobs that the respondent reported. It is quite likely that short periods of unemployment between jobs were not completely reported by the respondents.

In some cases the succession of jobs which a respondent held was not clearly defined. Particularly in small firms with no formal structure of jobs and wage rates, upward progression in the firm was usually accomplished by gradual wage increases and small additions to the employee's duties and responsibilities. All of these frequently occurred without any change in occupational designation.

An impromptu solution of this unplanned for contingency was the so-called "sliding job". A "sliding job" was a job starting at one level and ending at another level without any detailed related information between the starting and ending level. The absence of data being the criterion for such a job, an inconsistency in concept occurs depending on how completely the respondent presented the job information.

4. Job designations: Several designations of special interest were ascribed to particular jobs in the work histories.

a. First full-time job: In the work histories of many of the respondents, the first job was not always easy to identify, particularly where the jobs were concurrent with school attendance. The first full-time job was defined as the full-time job

obtained immediately after completing school, with the exception that if schooling was not continuous, the first full-time job after the completion of high school would be used to start the work history.

b. Present job: This is the reference used to describe the occupation which the respondent held at the time of the survey. Respondents who were unemployed or retired were classified according to the characteristics of the last job they held.

c. Instant job: In analyzing the job histories, occasion arises to refer to jobs at some specified point of time. Such jobs are differentiated from the present job, i.e., jobs held at time of survey, by being called instant jobs. Thus, jobs held by the sample of respondents in 1940 are referred to as the instant jobs in 1940.

d. Next-to-last job: The job on the work history immediately preceding the present job is the next-to-last job.

e. Best job, worst job: These refer to particular jobs on the work history which the respondent designated as best or worst. Although objective criteria were not specified, the designations "best" and "worst" were expected to provide some clue to satisfactions and dissatisfactions of the respondents.

It is important to note that the above designations are not mutually exclusive: several of the job designations can occur for the same item in the work history.

5. Socio-Economic Status: Occupations were not coded in detail, but were classified into categories of socio-economic status. The classification of socio-economic status was adopted from the U.S. Bureau of the Census's Classified Index of Occupations and Industries (Washington, 1950) with substantial modifications to meet some of the special requirements of the survey planners. The classification adopted is presented in the following tabulation:

The one-digit classification in the above table is closely related to the Census classification. The major modifications were the grouping together of all farm activities, and the amalgamation of the three categories of private household workers, service workers, and laborers into a single unskilled group.

The two-digit breakdown served to segregate the major categories into subcategories, not particularly adapted for analysis, but rather intended for amalgamation into sociological classifications. Thus, Tongue and Hand occupations were differentiated by grouping codes XX, XI, 10, 11, 20, 21, 22, 30 (Tongue) and aggregating codes 40, 41, 50, 51, 60, (Hand). Similarly high status occupations (codes XX, XI, 10, 11, 20) was segregated from low status occupations (codes 02, 21, 30, 50, 51, 60).

The above framework was used for each item requiring occupational classification, but had to be adapted to the peculiarities of the question or item. This was usually handled by augmenting the code presented above by additional code designations (codes, 7, 70, 71, 8, 80, 9, 90, 99, etc.) For instance, the coding of work history cards required the adding of categories for unemployment (code 80) and out of labor force (code 81). Military Service in World War II was separated out (code 90). Similar adjustments and adaptions were made in the several places where they were required, and not maintained uniformly throughout the occupational classification.

The difficulty in obtaining or recording complete occupational information from the respondent gave rise to another adjustment that is built into the classification above. Occasionally, it was impossible to

Code Number	Socio-Economic Status	Census Category	Special Adaptations
X	Professional	Professional, Technical and Kindred Workers	...
XX	Professional	...	...
X1	Sub-professional	...	Separates out occupations such as draftsmen, nurses, and laboratory technicians
0	Farm	...	...
01	Farm Owner and Manager	Farmer & Farm Managers	...
02	Farm Laborers and Farm Tenants	Farm Laborers and Foremen	...
03	Farm work - no level indicated	...	...
1	Business Owners and Executives	Managers, Officials, and Proprietors	...
10	Own business	...	...
11	Business Executives and Managers (Excludes low level supervisors performing similar work to those they supervise)	...	...
2	White Collar	Clerical and Kindred Workers	...
20	Upper White Collar	...	This breakdown attempts to segregate this very heterogeneous category into classes with less variation
21	Lower White Collar	...	
22	White Collar - no level indicated (Includes low level supervisors performing similar work to those they supervise)	...	
3	Sales	Sales Workers	...
4	Skilled	Craftsmen, Foremen and Kindred Workers	...
40	Foremen (Includes low level supervisors performing similar work to those they supervise)	...	...
41	Skilled	...	...
5	Semi-skilled	Operatives and Kindred Workers	...
50	Semi-skilled	...	...
51	Apprentices	...	...
6	Unskilled	Private Household Workers Service Workers Laborers	...

categorize the information in detail, which induced the establishment of categories "farm work - no level indicated" (code 03), "white collar - no level indicated" (code 22) and "manual workers and odd jobs" (code 7, 70, 71).

6. Major Industry Division: The coding of industry was confined to major industry divisions. The categories of the Standard Industrial Classification were followed, except that Transportation, Communications, and other Public Utilities were separated into individual divisions rather than being grouped together as is provided in the S.I.C. This special breakdown was made to enable hypotheses to be tested regarding the effects of the concentration of transportation facilities in the San Francisco Bay Area.

7. Geographical Location: In those instances where geographical locations were classified, the items were coded by states, grouped into regions. Provision was also made for locations outside the United States. The constituent elements of the regional breakdown are shown in the following tabulation:

Code Number	Description
1	New England
11	Maine
12	New Hampshire
13	Vermont
14	Massachusetts
15	Rhode Island
16	Connecticut
2	Middle Atlantic
21	New York
22	New Jersey
23	Pennsylvania
3	East North Central
31	Ohio
32	Indiana
33	Illinois
34	Michigan
35	Wisconsin
4	West North Central
41	Minnesota
42	Iowa
43	Missouri
44	North Dakota
45	South Dakota
46	Nebraska
47	Kansas
5	South
51	Delaware
52	Maryland
53	District of Columbia
54	Virginia
55	West Virginia
56	North Carolina
57	South Carolina
58	Georgia
59	Florida
6	East South Central
61	Kentucky
62	Tennessee
63	Alabama
64	Mississippi
7	West South Central
71	Arkansas
72	Louisiana
73	Oklahoma
74	Texas
8	Mountain
81	Montana
82	Idaho
83	Wyoming
84	Colorado
85	New Mexico
86	Arizona
87	Utah
88	Nevada
9	Pacific
91	Washington
92	Oregon
93	California
0	All foreign
01	NW Europe
02	Central Europe
03	East Europe
04	South Europe
05	Other Europe
06	Asia
07	America
08	All other
09	Amer. Possessions
XX	Not reported

8. Mobility Concepts: Flowing from the concept and treatment of the specific job are all of the measures of occupational, industry, and area mobility. For each job reported on the work history, the respondent also reported the occupation, the industry, and the area in which the job was located. Thus, by viewing each pair of jobs in succession, it is possible to focus attention on the changes that took place from one job to the next. This was the fundamental objective of the labor mobility survey -- to study the conditions surrounding the changes in jobs. The described treatment of the successive items on the work history led to the following mobility concepts.

a. A job change, because of the manner in which a job is defined, reflects a change in employer, in occupation, in industry or in locality, and in most cases reflects changes in several of these factors at the same time. Job changes are also recorded when a worker reports a period of unemployment or out of the labor force.

b. An occupational shift is a change in occupational designation as reported by the respondent; such a shift could occur while the respondent worked for the same employer or could accompany a change in employer. Provision is also made to record the shifts in occupation measured from jobs held prior to periods of unemployment and out of the labor force. The frequency of occupational shifts is solely dependent on the respondents' reporting that an occupation has changed. Other systems of recording occupational shifts, such as determining whether successive occupational designations fall within a standard item of an occupational classification, were not used in the determination of occupational shifts.

c. An industry transfer represents a job change accompanied by a transfer from one industry classification to another. An important aspect in the measurement of industrial mobility is that the amount of mobility varies in relation to the degree of detail with which the industry is classified. This may be termed the "classification effect." Thus, if finely detailed industry classifications are used, the number of industry transfers will be relatively large; if broad industry categories are used, the frequency of industry shifts will be smaller. The classification of industries used in this survey was the industry division breakdown, and therefore the relative frequency of industrial transfers is smaller than it would have been if a finer industrial breakdown had been used.

d. A geographical move is a job change accompanied by a move from one locality to another. For this purpose, the San Francisco Bay Area is considered as one locality. Similarly for other localities, there was the clear tendency for respondents to report the major city in a metropolitan area and ignore moves from city-to-city within the locality. Technically, there can be "classification effect" in geographical moves depending on how areas are defined, but it is quite probable that this would be of minor magnitude.

In summary, job changes are the basic unit of study, comprising all of the types of changes, shifts, transfers, and moves that occur in the work history. Although a job change can occur without an associated occupational shift, industry transfer, or geographical move, the latter concepts cannot occur without a job change. Also, two or all three types of movement can accompany a job change. The following is an

exhaustive list of all the combinations of mobility types that may accompany a job change:

a. occupational shift, industry transfer, and geographical move,
b. occupational shift, industry transfer, no move
c. occupational shift, geographical move, no transfer
d. occupational shift, no transfer, no move
e. industry transfer, no shift, no move
f. geographical move, no shift, no transfer
g. no shift, no move, no transfer

The relative frequency of job changes, occupational shifts, and geographical moves directly reflects the respondent's reporting of such items in the work history. On the other hand, the industry shifts are definitely subject to "classification effect."

B. Interviewing .

The administration and planning of the interviewing was subject to important revisions as the survey progressed toward completion. Reevaluation had to be made in the course of the survey regarding the time schedule for completing the job and also of the cost elements in the survey. The time and money allocated to the interviewing process proved inadequate and adjustments to correct for these inadequacies were made. The deadline for completion was extended, and funds for the payment of "clean-up" interviews were made available.

The original plans for the Oakland Labor Mobility Survey provided that student interviewers would be used. These interviewers were to be unpaid except for expenses related to their travel to and from the localities where the interviews were to be conducted. These unpaid student interviewers were to be provided from classes conducted by senior members of the survey planning committee -- classes in survey and research

methodology. Graduate students from the School of Social Welfare's courses in Social Welfare Research and the Seminar in Research Problems and Methods constituted about one-half of the total interviewing staff. Another 25 percent were supplied from the Social Psychology undergraduates who were interested in the survey technique. The remainder were supplied by the Sociology Departments' course in Social Theory and Method. The survey was to constitute a term-long laboratory exercise and the inducements to participate were the usual academic ones, - i.e., interest in the subject matter, course credit, and a grade upon completion.

Similarly, the time element was planned on what seemed to be a reasonable basis. With a staff of seventy-five interviewers to complete the survey, individual interviewing quotas of fifteen to twenty interviews were established, and it appeared that this number could be completed in the span of two months time. The months of February and March 1949 were established as the interviewing months so that at least the seasonal factors would be similar to those prevailing during the 1950 census, with which some of the data might be compared.

As has been suggested, both of these elements in the survey planning proved inadequate. The students' participation was hampered by class schedules, by outside work and non-school activities, and by the normal variations in classroom performance and interest. This had its effect on the time element and the completion deadline was postponed several times. In the course of this interviewing procedure, the variations in goals and penalties incident to the student's course work made the imposition of survey discipline easier among the graduate students than among the undergraduates.

By May 1949, it was clear that the original sample was not going to be completed under the then current arrangements. Furthermore, the completed interviews were clearly not representative of the sample that was drawn, a tendency to complete the interviewing in areas closer to the University being clearly apparent. The pressures of the terms' end, including studying for finals, preparing to leave for the summer, etc. led to a revised plan for completion. From among the original interviewers, a small group whose performances were outstanding were to be hired as paid interviewers and would complete the sample of block segments. This process would take place as soon as this interviewing nucleus was available at the end of the semester. Additionally, since the areas were far away from the campus, arrangements were made to use university automobiles to speed up the time in transit. Approximately one-sixth of the survey questionnaires were provided by this "clean-up" squad, and interviews were completed as late as August 1949.

Training in interviewing procedures for the survey took place as part of classroom instruction in the courses mentioned above. The questionnaire and the results of the pilot survey were analyzed, and criticized and there was a general orientation to the purposes of the survey through these discussions. It is probable that the individual classroom leaders differed in their emphasis as to the importance of the various phases and elements of the survey. Not until the interviewers were to go out into the field was a standard set of instructions prepared, and in retrospect, it is clear that this interviewers' guide overlooked several important factors. On the other hand, it very effectively crystallized into a standardized and coordinated direction

the various channels in which discussion had traveled.

Interviewing training also was conducted by means of mock interviews in front of the class, and by actual field interviewing in the second pilot study. Here, too, differences in emphasis and instruction were inevitable.

Thus, the interviewing contains two sources of bias which might not have been present if a more homogeneous group of persons had been selected to do the work under more ideal conditions. First, because every member of the classes involved participated, the variability among individual interviewers was probably greater than it would have been if they had been selected for their conformance to a set of appropriate standards. Secondly, the differences between the classes might have been substantial because of differences in instructional emphasis and also because of the factors related to the distinctions between graduates and undergraduates.

Before going into the field, individual interviewers sent a form letter notifying the householder at every assigned address of the survey and of his selection as a member of the sample. The interviewers carried duplicate copies of the form letter and cards identifying themselves when contacting the respondents. A record of all contacts and attempted contacts was kept on a control sheet and all cases where no contact was obtained after three call backs or an initial refusal was elicited were referred to the interviewing supervisor for disposition. If the potential respondent gave a vehement refusal no further attempts to obtain an interview were made. In many cases the original interviewer recontacted the respondent, and in other cases another interviewer was assigned to try and get the interview. Some interviews were obtained after as many as three

refusals. In areas where no one could be contacted at a given address the number of call backs was sometimes as high as thirteen if the interviewer had occasion to be in the area a great deal. A written report was required on all refusals stating the reasons given by the householder and making an estimate of the socio-economic status of the respondent.

In the 134 block segments assigned for interviewing, a total of 1242 dwelling units were contacted. Of these, 20 were vacant and in 49 others there was no eligible respondent. In the remaining 1173 households, 953 interviews were obtained, a total of 81.2% of the eligible sample. The detailed analysis of the non-responses is presented in the accompanying table.

Table 1 -- Disposition of dwelling units contacted in the Response experience Oakland Labor Mobility Survey

Disposition	Number		Percent	
Dwelling units contacted	1242		--	
Vacant		20		
No eligible respondent		49		
Total eligible units in sample	1173		100.0	
Codeable interviews		935		79.7
Unusable interviews		18		1.5
Questionnaires filed	953		81.2	
Non-Response	220		18.8	
Direct Refusal		95		8.1
Unable to contact		75		6.4
Ill or hospitalized		16		1.4
Language handicap		5		.4
Respondent out of area		24		2.1
Miscellaneous		5		.4

The reasons for the relatively high proportion of direct refusals were summarized from the interviewers' reports. Some respondents who

were reluctant to be interviewed gave the impression that they were engaged in extra-legal activity. There were a number of persons who were emotionally and psychologically disturbed. Some individuals, particularly those who worked hard or for long hours wanted to get away from their job and consequently were reluctant to discuss their employment history. In one area, the recent use of a "survey" as the basis for selling books made the respondents over-cautious regarding the survey technique. The inexperience of the interviewers was also a crucial factor.

C. Sample Design

Several considerations that may be considered non-standard contributed to the thinking concerning the sample design of the Oakland Labor Mobility Survey. First of all, costs were not budgeted on an overall basis, but rather were thought of in incremental terms. The planning staff, and several of the technical workers concerned, were part of the Institute staff on a permanent basis. It was planned that the interviewing and even the coding were to be completed by student personnel. The Institute secretarial and office facilities were available. Finally, the analysis was to be made by some of the persons on the planning committee. Thus, direct costs were considered negligible and were not a factor in the sample design.

A second item of importance was the recognition that intergroup comparisons rather than overall estimates were to be the focus of attention. This meant that individual subgroups had to be large enough so that intergroup differences would not be overshadowed by the sampling variability of those differences. Little was known in advance, however,

of the magnitudes of the groups except for the crude data from the pilot studies. This was particularly a problem because of the many variables that were introduced into the questionnaire. As is well known, planning an appropriate sample that is representative of one variable can be easily accomplished with a little advance information. Each variable that is added determines its own characteristic pattern, however, and a multi-variable survey is, in the end, a compromise among the contending factors.

Thirdly, the need for administrative control became increasingly apparent. Central direction and responsibility had to be assumed somewhere in the survey process in order that the several groups working on their parallel functions should be coordinated with one another. In addition, individual workers had to be monitored, their tasks and goals clarified, and their work reviewed and evaluated.

Fourth, there was no experienced survey mathematician among the survey planners. Mathematical problems were left suspended until a framework of survey decisions had already been crystallized. In some cases, the participation of a survey statistician concurrent with other planning personnel might have resulted in a different survey design.

At first, the whole San Francisco-Oakland-East Bay Area was thought to be the appropriate geographical area to be surveyed. This area, covering some 150 square miles and separated by the stretches of San Francisco Bay, was clearly much too extensive for the resources and facilities which the Institute could command. In addition, the survey was not directly oriented at obtaining an area-wide estimate of mobility magnitudes. Rather, the importance of relative measures among and between

various groups covered in the survey was to be emphasized. This reasoning led to the selection of Oakland, an area of only 53 square miles but with a heterogeneous population, convenient from the standpoint of accessability, and much more familiar geographically to the potential survey staff personnel.

Not all of the geographical area of the city of Oakland was used, however. The focus of the survey being on "normal" workers, it was decreed that the extremes of the social scale should be eliminated. A convenient instrument to accomplish this purpose was at hand in the form of Tryon's scale of social economic areas.* Tryon found that a clustering of socio-economic variables occurred in particular census tracts which could be classified into homogeneous categories that served to differentiate separate socio-economic groups in the population. The untested hypothesis was adopted that tracts characterized by such conditions as low rentals, industrial buildings, high proportions of non-whites, and other correlates of substandard living conditions also had "abnormal" mobility characteristics. Such tracts were therefore excluded from the survey. To balance this deletion, those Census tracts which were at the opposite end of the Tryon scale were also left out. These were the "blue stocking" neighborhoods, the high income sections characterized by large individual homes, high rentals, high proportions of home ownership, and other indexes of social and economic advantage. Of the 71 census tracts in Oakland, eleven low status and six high status tracts were eliminated.

The rationale behind the procedure discribed above has never been clearly justified, but somewhere in the planning process it was adopted. It therefore constitutes a qualification which must be considered in

* See 1954 Social Forces re: homogeneity of census tracts.

evaluating the comparability of the survey with basic population and labor force data, and with other mobility surveys. At one end of the scale, potential respondents with low skills and living under marginal economic conditions would be underreported. At the opposite extreme, professional, proprietor, and managerial respondents would be underreported. However, neither of these classes were excluded from the survey if they were contacted in the census tracts which were sampled in the survey.

The need for administrative control, particularly of the interviewing process, led to the adoption of cluster type area sampling. Advance knowledge of the high degree of correlation among householders of the same city block pointed toward some kind of curtailment in the size of the clusters to less than a whole block. The administrative feasibility of interviewing a row of households was the basis for finally selecting block sides as the sampling units.

The sample size represented a combination of administrative, judgmental, and crude statistical elements. The bulk of the survey data were to be in the form of percentages. Thus, differences in percentages between subgroups were the controlling concept. Using the 95 percent confidence interval, a coefficient of variation of .10 was posited for proportions around 50 percent. This would represent a standard deviation of .05 and roughly a spread of ten percentage points for significant differences. It was understood that the coefficient of variation would be larger for percentage levels that were removed from the 50 percent level.

Random samples of the following sizes are necessary to obtain proportions that meet the above specifications:

Subgroup 1	Subgroup 2
110	400
120	550
130	400
140	350
150	300
160	250
180	225
200	200

Cluster samples, because of intra-class correlation, have to be larger than random samples: the increase in size depending on the amount of intra-class correlation. For the Oakland Labor Mobility Survey, the subgroup sizes had to be larger than indicated above. It was in the context of the above scale of values that 1000 households were set as the sample size. This determination was also related to the staff available (75 student interviewers) and the number of interviews that each interviewer could reasonably accomplish in two months (around 15 households).

The individual clusters of households were then determined. A block map of Oakland from the 1940 Census was used. This map was corrected to show the establishment of new subdivisions, new streets, and other changes in the block pattern which had occurred since 1940. The newly-formed blocks were numbered in the sequence established by the Bureau of the Census. Census tract designations were already in numerical form and in sequence and therefore, could be used without any ~~adaption~~ adaptation or conversion. Then from a table of random numbers, ~~six~~ seven digit numbers were drawn and kept in sequence. The first two digits selected the Census

Tract, the second ~~two~~ three determined the block within the tract, and the last two controlled the side of the block. (Two even numbers selected north, two odd chose south, odd-even was last, even-odd pointed west. The block side most closely ~~in the direction of~~ facing the selected direction was the cluster of households sampled).

Interviewers control sheets were made out individually for each cluster. These sheets were taken to the Oakland City Engineer's Office, where a specific list of addresses were posted to the control sheet from detailed block maps. All house numbers were posted by tracing clockwise around the block to the selected block-side, starting at the corner lot thus determined and ending without the corner lot at the end of the block. Each blockside contained but one corner unit, not both of them. Thus, each control sheet had a set of households determined in advance for the interviewer. However, in a few cases, dwelling units not reported on the maps were discovered in the field. These were included in the clusters. The advance selection of households from block maps proved extremely useful and saved much exploratory work that might have been done. For instance, many of the blocks drawn turned out to be "zero" blocks, i.e., blocks without residences. Schools and other public buildings, business establishments, and unimproved land were the usual causes of "zero" blocks. A small island inhabited ~~solely~~ exclusively by ducks and seagulls in the middle of Lake Merritt was one of the randomly drawn block segments. The use of the detailed block maps saved considerable travel and activity by eliminating zero blocks from the sample in advance.

D. Coding and Tabulating

The coding of the survey questionnaires was a detailed, tedious, extensive, and well planned procedure. The magnitude of the problem can be appreciated by considering that the 15 page questionnaire contained 100 questions, many of which had several parts. The ~~magnitude~~ wide scope ~~of the problem~~ of subject matter and the keen interest in complex cross classifications among the many variables dictated that machine tabulating methods be used. The coding plan was therefore designed for IBM punch cards.

A code guide was assembled with a page of coding for each question or part of an item. ~~Five~~ Six different card layouts were necessary to record all of the information. They were:

1. Job cards, itemizing the information from the work history covering one job, i.e., one line of the work history.

2. Respondent cards, recording the information related to the individual who was interviewed.

   a. The social mobility card, amalgamated all of the recorded data regarding such items as fathers's occupation and industry, brother's occupation, urban-rural origin, and similar information.

   b. The geographical mobility card collected information mainly oriented to the hypotheses involving geographical movement.

   c. The work career card recorded the relative proportion of time spent in various classes of socio-economic status.

   d. The organization card tabulated the respondents activities outside of his job, with particular reference to formal organizations to which he belonged.

3. Work history cards, summarizing job status and job mobility experience at specified points within and at the end of the respondents working career.

For each type of card, a summary code sheet was prepared in such form that it was easily scanned by the key-punch operators. The summary code sheets were filled out by the coding clerks, who working

from the answers on the questionnaire, recorded the appropriate codes on the summary code sheets. The summary sheets were then collected in batches and turned over to the key-punch operators for punching and verification.

The coding procedure was organized so that the same portion of each questionnaire was coded by either one coder or two coders working together. By keeping the questionnaires in batches, which were easy to pass from one code station to the next, there was much more efficiency to be gained than having each code clerk learn the complete procedure for the whole questionnaire. Furthermore, this decreased the possibility of coding variation because all the comparable portions of the questionnaires were coded by the same individual. A further element of administrative control was exerted by the organization of the coding procedure into a formal sequence of operations - an assembly line of coders. Each batch started out at the beginning station and was passed consecutively around the coding room. The accumulation of too many batches of schedules at some particular station was immediately apparent, and signaled for the revision of the workloads at each station until a balanced flow of work was moving through the process. Control sheets were also kept on the batches, each coder initialling the batch upon completion of his section of the coding. This enabled the coding supervisor to correct errors in procedure among individual coders without detailed initialling on each schedule.

As the batches were finished, the coding supervisor audited the code summary sheets for completeness, checked the coded items in the questionnaire and made immediate corrections jointly with the code clerk concerned.

After the initial breaking-in period, the procedure settled down to a smoothly flowing, relatively errorless process.

Tabulating and card punching were completed by specialized agencies equipped to accomplish these procedures. The punching and verifying of the IBM cards was completed by the tabulating section of the California Division of Labor Statistics and Research. The tabulating was performed on the equipment of the IBM unit maintained by the Electrical Engineering Department on the Berkeley campus of the University of California. These functions appear to have been accomplished with great efficiency and thoroughness.

IV. The Survey

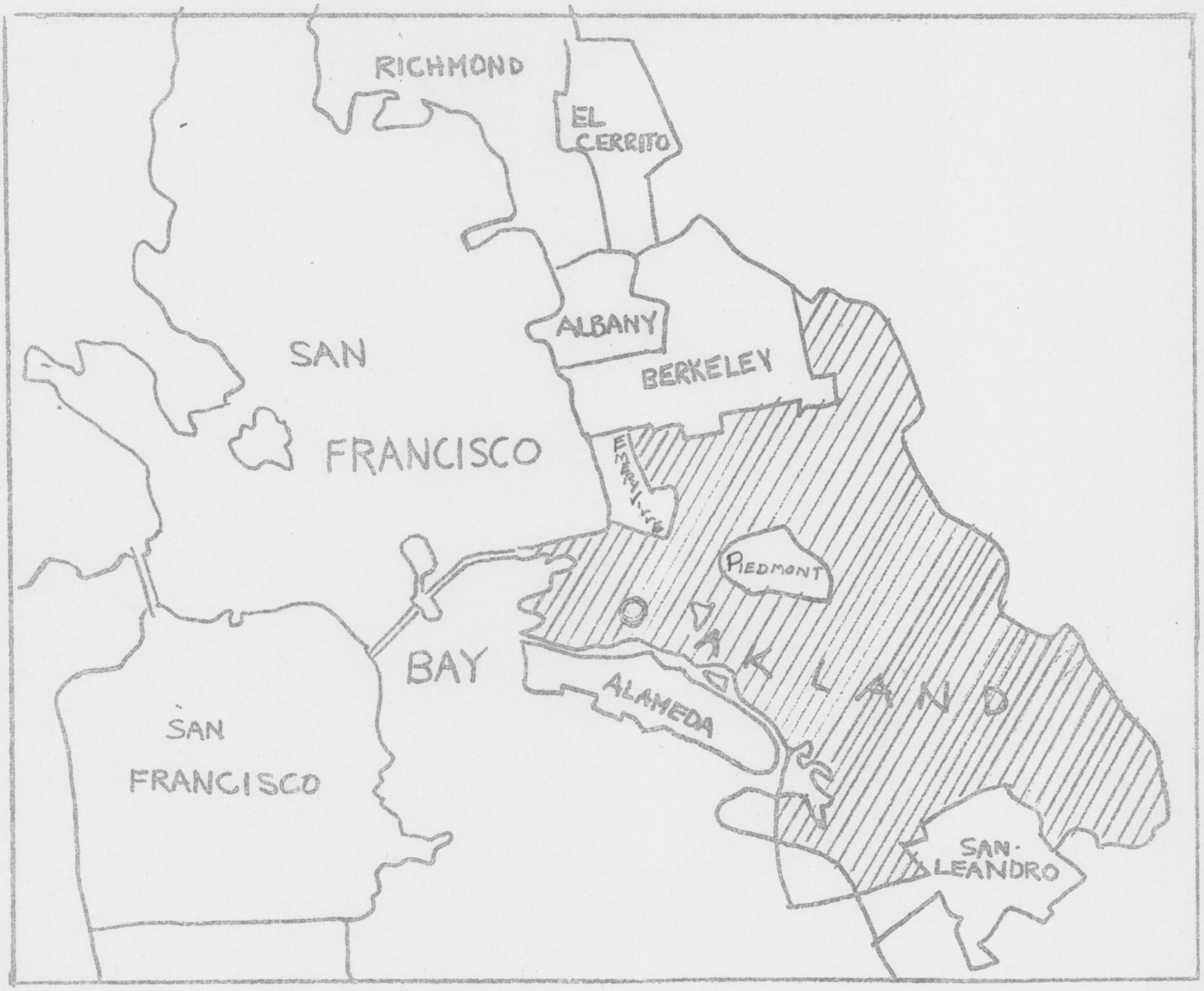
A. General economic characteristics of the Oakland Labor Market

In order to properly evaluate the nature of the Oakland labor force, it is necessary to appraise the place of the city of Oakland in the Bay Area community. The San Francisco-Oakland Metropolitan Area consists of a group of six contiguous counties grouped around San Francisco Bay. The area has a population of around two and a quarter million persons, of whom approximately one million are in the labor force. The city of Oakland has about 400,000 persons living within its boundaries, and a labor force of 175,000 workers.

Geographically, Oakland lies on the east shore of San Francisco Bay and is part of a densely populated area that encomposses a number of East Bay communities. Despite the different local government jurisdictions that administer this strip of cities, the physical city is continuous from Richmond on the north, through El Cerrito, Albany, Berkeley, Emeryville, Oakland, Alameda, and San Leandro, to Hayward on the South. Thus, Oakland is a separate government jurisdiction in a much larger physical and geographical community.

In addition to Oakland's physical contiguity with the East Bay strip of cities, it also has marked economic and community relationships with San Francisco. The San Francisco Oakland Bay Bridge provides a physical connection for automobiles and interurban transit. Both cities have a interconnecting set of telephone exchanges which are toll-free for business. Many local firms have branches on both sides of the Bay and most of those that have only one central location on either shore sell and deliver their goods or services without premium or penalty over a broad transbay area.

Figure 1. Oakland and adjacent cities



Because of this interrelatedness of the San Francisco Bay communities, the character of the work force in Oakland reflects, even though imperfectly, the industrial character of the whole Bay area. Many Oakland residents work outside of Oakland and most of Oakland's business establishments have employees from outside the city. But it is also true that people of similar socio-economic status tend to concentrate in particular areas of the community. Where such concentrations are separate cities, the communities reflect special characteristics. Oakland has at least two areas adjoining it which pull special groups into their boundaries and therefore exert influence on the character of the Oakland labor force. Piedmont, a "blue stocking" enclave, is a separate city with a concentration of high income professional, executive, and business proprietor groups. Similarly, Emeryville is a concentrated industrial area with only a small population of low income workers. In addition, several nearby communities, such as El Cerrito, are predominantly "dormitory" areas, primarily providing residential facilities for employees who work in other industrial and business sections of the community. By pulling homogenous but partial segments from the area labor force, these communities have a direct influence on the makeup of the labor force residing in the city of Oakland.

An additional qualification of significance in evaluating the survey is the progressive decline in employment that occured in late 1948 and into 1949. The minor cyclical trough in economic conditions which occurred in 1949 had local manifestations which were clearly observable. Monthly reports of the Oakland offices of the California Department of Employment clearly indicate the developing decline of business expectations from September 1948 forward. The 1948 Christmas season was below the previous

year in employment activity and the businessmen in Oakland reflected uncertainty and reported markedly low activity through the early months of 1949. The seasonal advance in food processing industries that characterizes the local economy was the only buoyant influence until late in the year. It was during the period of uncertainty and business doldrums that the survey took place, and this may have reflected itself in some of the reporting by the respondents.

B. The Sample of Respondents

It is important to distinguish between two kinds of samples that are included in this survey; one a sample of respondents and the second, a sample of jobs contained in the specific work histories of the respondents. The objective of this section is to present an overall picture for descriptive rather than analytical purposes of the sample of respondents that was surveyed. The sample of jobs will be described in the subsequent section.

Comparisons of the survey data with 1950 Census data are possible for a few of the variables in the following tables and have been shown in all cases where they can be made. An analysis of these comparisons offers a rough guide to the biases, conceptual differences, and sampling variations that were incurred in the actual survey. The Census data which are presented have in all cases been adjusted to be coordinate with the area surveyed in the Mobility study. In general this involved the specific deduction from Census data for the City of Oakland of the seventeen Census tracts that were omitted from the survey. These omitted census tracts account for approximately 20 percent of the population and labor force counts for Oakland.

Table 2 presents the sex breakdown of the surveyed group compared

Table 2--Percentage Distribution of Respondents in Labor Mobility Survey and Members of Labor Force in 55 Census Tracts in Oakland, by sex.

Sex	Labor Mobility Survey		1950 Census	
	Number	Percent	Number	Percent
All Respondents	933	100.0	140,732	100.0
Male Respondents	797	85.2	94,616	67.2
Female Respondents	138	14.8	46,116	32.8

Table 3--Percentage Distribution of Respondents in Labor Mobility Survey and Members of Labor Force in 55 Census Tracts in Oakland, by color.

Color	Labor Mobility Survey		1950 Census	
	Number	Percent	Number	Percent
All Respondents	933	100.0	140,732	100.0
WHITE ~~Male~~ Respondents	842	90.2	124,199	88.3
NON-WHITE ~~Female~~ Respondents	91	9.8	16,533	11.7

with the Census data for the labor force. Because the Census data does not distinguish family heads from secondary workers, the large number of female workers who augment family earnings as secondary workers are included there. This accounts for the higher proportion of women in the labor force than in the respondent group, and the offsetting differences in the males. This relationship is corroborated by the San Francisco data of the Six-City Study of Labor Mobility[1] which shows that among family heads, only eight percent are females, in contrast to the corresponding census data which shows that one-third of the labor force is female.

[1] Six-City study, Background Report and preliminary analysis of household data relating to San Francisco (Berkeley, Institute of Industrial Relations, University of California, 1951), p. 36 H.

The color composition of the survey sample and the census labor force is compared in Table 3. The degree of conformity between the two data sources indicates that a typical bias of interviewer type surveys, i.e., underrepresentation of minority groups, was not typical of the mobility data.

Another factor on which comparison is available is the occupancy status of the two sources of data. Table 4 shows that the proportions of owner occupied and renter occupied dwelling units was very similar in the survey and the Census.

The breakdown by occupational groups of the survey and census data are shown in Table 5. The general conformity of the percentages in the occupational categories is marred by a substantial overrepresentation of respondents, among males and females, in the white collar categories, and an underrepresentation of respondents in the unskilled categories.

Table 4--Percentage Distribution of Respondents in Labor Mobility Survey and of Dwelling Units in 55 Census Tracts in Oakland, by Owner or Renter status.

Status	Labor Mobility Survey		1950 Census	
	Number	Percent	Number	Percent
TOTAL	931	100.0	106,426	100.0
Owner occupied	516	55.4	55,441	52.1
Renter occupied	415	44.5	50,985	47.9

Table 5--Percentage Distributions of Male and Female Respondents in Labor Mobility Survey and Employed Members of the Labor Force in 55 Census Tracts in Oakland, by Major Occupations Groups.

Major Occupational Group	Labor Mobility Survey		1950 Census	
	Number	Percent	Number	Percent
Male Respondents	797	100.0	85,407	100.0
Professional	50	6.3	7,685	9.0
Business Owners and Executives	128	16.0	12,396	14.5
White Collar	178	22.3	7,647	8.9
Sales	58	7.3	8,301	9.7
Skilled	201	25.2	20,185	23.6
Semi-Skilled	124	15.5	14,212	16.6
Unskilled	53	6.7	14,399	16.8
Occupation not reported	5	.6	582	.7
Female Respondents	138	100.0	42,239	100.0
Professional	18	13.1	5,801	13.7
Business Owners and Executives	10	7.2	2,611	6.2
White Collar	73	52.9	16,225	38.4
Sales	8	5.8	4,144	9.8
Skilled	1	.7	674	1.6
Semi-Skilled	19	13.8	4,845	11.5
Unskilled	7	5.1	7,566	17.9
Occupation not reported	2	1.4	373	.9

In view of the fairly good correspondence of the data on sex, color, and home ownership, it is possible that the bias that is apparent in the occupational breakdown is a conceptual and procedural one built into the survey plans and concepts and does not represent a poor physical sampling of the population per se. One source of this bias might be the classification of low level supervisors in the occupational category of the workers they supervise rather than in the executives (managerial) category. Another factor which contributes to the overrepresentation of white collar workers is the high proportion of retired workers who are classified in the white collar category. (See Table 6) But neither of these explanations accounts for the whole discrepancy that is shown. Nor is it possible to account for the underrepresentation of unskilled workers by either of these explanations.

The labor force status of the respondents in the mobility survey is detailed in Table 6. The proportion of workers unemployed in the survey is substantially less than reported in the 1950 census but the non-comparability of family heads with the total labor force makes this comparison nugatory. The relative differences in the incidence of unemployment among socio-economic groups in the sample conforms to accepted generalizations that unemployment hits manual occupations more than white collar occupations. The relative occurrence of retired persons also fits the pattern of preconceptions regarding the ability to retire, for it shows that persons with white collar occupations have a high propensity to be retired. The high proportion of respondents in the unskilled classifications who are retired is unexplainable, however. It is possible that some of this group were unemployed at the time of the survey, but were reluctant to admit to unemployment at the time of interview.

Table 6--Percentage Distributions of Respondents in Specified Socio-Economic Status of Present Job, by Labor Force Status

Major Occupational Group	Labor Force Status			
	Total	Employed	Un-Employed	Retired
	Number			
TOTAL	935	846	29	60
Professional	68	63	2	3
Business Owners & Executives	138	128	-	10
White Collar	252	228	5	19
Sales	66	61	-	5
Skilled	200	182	10	8
Semi-Skilled	143	128	9	6
Unskilled	60	48	3	9
Other	8	8	-	-
	Percent			
TOTAL	100.0	90.5	3.1	6.4
Professional	100.0	92.7	2.9	4.4
Business Owners & Executives	100.0	92.8	-	7.2
White Collar	100.0	90.5	2.0	7.5
Sales	100.0	92.4	-	7.6
Skilled	100.0	91.0	5.0	4.0
Semi-Skilled	100.0	89.5	6.3	4.2
Unskilled	100.0	80.0	5.0	15.0
Other	100.0	100.0	-	-

C. The Sample of Jobs

The job sample represents an aggregation of the individual jobs reported on the respondents work history. Each personnel history was broken down into its constituent jobs and for each job, the associated job shifts that ~~preceded~~ followed the job were catalogued and coded. Thus, the sample represents the descriptive characteristics of jobs and the mobility between jobs at the same time.

It is important to recognize that the distribution of jobs from work histories is quite different from the distribution of jobs at some point of time. Table 7 compares the distribution of respondent's present occupations with that of the aggregate of jobs in the work histories. Although there is some crude correspondence between the two sources of data, it is the differences in these proportions that can give the greatest insight into the nature of the data.

At least three factors are of extreme importance in evaluating these differences. One is the differences in turnover and movement that are characteristic of certain specified categories. The relative turnover of jobs in each category in relation to the present jobs of respondents is shown by the averages in the last column of Table 7. Excluding war service, and shifts out of employment or out of the labor force, the average number of shifts per respondent was 6.3. But several socio-economic categories have lower averages; namely, business owners and executives, skilled workers, professionals, and white collar workers. The predominant characteristic of these groups of jobs is that they are the goals or end points in the ladder of aspirations. Upon attaining them, turnover is extremely low although it can and does occur.

Table 7--Number and Percentage Distribution of Jobs in Work Histories and of Respondents Present Occupations, and Average Number of Jobs Per Respondent, by Socio-Economic Status.

Socio-Economic Group	Jobs in work histories		Respondents present occupation		
	Number (1)	Percent[1] (2)	Number (3)	Percent[1] (4)	(1)/(3)
TOTAL	6945	-	935	-	7.4
All Jobs in Civilian Employment	5810	100.0	927	100.0	6.3
Professional	300	5.2	68	7.3	4.4
Farm	193	3.3	-	0.0	-
Business Owners & Executives	439	7.5	138	14.9	3.2
White Collar	1245	21.5	252	27.2	4.9
Sales	462	7.9	66	7.1	7.0
Skilled	1193	20.5	200	21.6	4.2
Semi-Skilled	1372	23.6	143	15.4	9.6
Unskilled	606	10.4	60	6.5	10.1
Other	1135	XXX	8	XXX	-

1. Percentage distributions were calculated excluding the "other" categories. "Other" includes war service jobs, periods of unemployment and labor force non-participation.

The classifications with high turnover are unskilled, semi-skilled, and sales. These are categories through which workers flow as they try to achieve their occupational goals.

The second important qualifying factor in interpreting the average turnover of jobs in the work histories is the present age distribution of the respondents. The older people are, the more opportunity they have had to change jobs. It is easy to visualize that a general population of workers over fifty years of age would have more job changes than one less than 30 years of age. Although the demarcation is less distinct in this sample the individual socio-economic categories have persons of differing age in them, and this variation in age distribution also manifests itself in the differences in turnover.

Finally, we must recall that the respondents are family heads and do not include secondary workers. On the other hand, the work histories do include jobs that may have been filled at the time when the respondent was not the family head.

Other factors that contribute to the differences in proportions between respondents present job and the total of jobs in the work histories are the sex ratio of respondents, the differing impact of unemployment on the several socio-economic groups, and other reasons.

The work histories which were collected in the survey are life work histories, that is, complete in the time dimension. It was apparent that "recollection bias" grew as respondents filled in or forgot about the earlier portions of their work histories and this constitutes an important qualification on the aggregation of jobs that are herein described.

A more significant qualification which must not be overlooked is that the data for earlier dates represents, not cross-sections of the working population at those dates but rather the proportionate importance of work history characteristics of workers surviving to the present.

Table 8 shows the distribution of jobs of particular socio-economic status by the year in which the respondent started that job. It shows further that of all the job changes that occurred in the work histories, 36.2 percent of them occurred in the years 1940-49, 22.8 percent in the thirties, 19.2 percent in the twenties, and 21.7 percent prior to 1920. If job changes were a constant element in our economic development, the proportion of job changes in each decade would be the same. However, business conditions and the age of the worker are two among many factors which affect the incidence of job changes through time.

We can visualize best what is included in the sample of jobs by imagining what is missing. As we view the Oakland labor force in 1949 and peer into the past, there are two groups of individuals whom our surveyors were not able to interview: first, those who were in the Oakland labor force in the past but have migrated to some other place; and second, those who have died. Included in our sample are those who are indigenous to the area plus those who migrated into the area and remained to the survey date. But since life work histories have been surveyed the job sample also includes jobs held by in-migrating respondents in other labor markets prior to their arrival in Oakland. Both of the excluded groups are not representative cross-sections of the labor force: those who ~~did~~ died have completed their careers, and in many cases, have attained their occupational goals. As age increases, the mobility turnover slows down and the aggregate pattern for these older age groups has elements of stability.

Table 8--Percentage Distributions of Jobs Starting In Specified Years by Socio-Economic Status.

Socio-Economic Group	Year Job Started									
	All Jobs		1940-49		1930-39		1920-29		Before 1920	
	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent
TOTAL	6945	100.0	2519	36.2	1581	22.8	1337	19.2	1508	21.7
All Jobs in Civilian Employment	5810	100.0	1985	100.0	1299	100.0	1189	100.0	1337	100.0
Professional	300	5.2	112	5.6	68	5.2	64	5.4	56	4.2
Farm	193	3.3	11	0.6	42	3.2	51	4.3	89	6.7
Business Owners & Executives	439	7.6	126	6.3	133	10.2	92	7.7	88	6.6
White Collar	1245	21.4	502	25.3	252	19.4	244	20.5	247	18.5
Sales	462	8.0	125	6.3	129	9.9	102	8.6	106	7.9
Skilled	1193	20.5	462	23.3	201	15.5	201	16.9	329	24.6
Semi-Skilled	1372	23.6	465	23.4	316	24.3	303	25.5	288	21.5
Unskilled	606	10.4	182	9.2	158	12.2	132	1.1	134	10.0
Other	1135		534		282		148		171	

These forces are absent from the data because of deaths of the labor force members prior to the survey.

The migrating group is characterized by higher than normal mobility and their departure and consequent exclusion from the sample results in a less than normal amount of mobility being reported in the aggregate among those who remain. The intermingled effects of those two sets of forces depends on their relative quantitative importance, but on this there is no available data.

In spite of these precautionary qualifications, the structure of jobs shows a relatively consistent stability through the decades covered by the work histories. The declining proportion of farm jobs represents a cumulative shift in the working population from rural to urban centers. There is a significant increase in the proportion of white collar jobs in the 1940's over the past, which may be partly attributable to the special characteristics of the female workers included in the sample. In the main, however, the proportions of jobs in the other socio-economic groups are fairly stable over time.

The description of the respondents sample and the sample of jobs has served to bring out the multitude of variables that have some effect on the measurements which have been presented. These simple qualifications can and are subject to correction in the more detailed analysis that has been made of the Oakland Labor Mobility data. It is obligatory to keep these complexities in mind when observing the crude measures of mobility that are presented in Table 9. Here are compared the relative frequencies of three forms of mobility; occupational, industrial, and geographical. The data show that with two significant socio-economic exceptions, job

Table 9--Relative Occurrence of Occupational ~~Changes~~ Shifts, Industry Transfers, ~~Shifts,~~ and Geographical Move~~ments~~s, in Relation to Job Changes, for Jobs in Specified Socio-Economic Groups.

Socio-Economic Status of Instant Job	Job Changes	Occupa-tional Shifts	Industry Transfers	Geographi-ical Moves
TOTAL	100.0	72.9	61.3	36.3
Professional	100.0	39.1	84.7	52.6
Farm	100.0	87.3	72.4	81.1
Business Owners & Executives	100.0	84.2	51.8	33.6
White Collar	100.0	76.8	65.0	28.4
Sales	100.0	68.2	58.2	33.5
Skilled	100.0	56.6	48.0	42.3
Semi-Skilled	100.0	72.4	62.0	34.4
Unskilled	100.0	79.5	73.2	41.5
Other	100.0	97.7	74.1	27.7

changes involve occupational shifts more frequently than industry transfers. Similarly, industry transfers are more frequently occurring than geographical moves. The exception among the geographical movement rates is the high movement index among farm jobs. This is explainable primarily by the nature of farm work. A shift of jobs in the farm economy almost inevitably involves a shift in locale from one farm to another, and therefore a geographical move. The second exception is the low proportion of professional moves characterized as occupational shifts. The professional worker apparently establishes and maintains his occupational connection despite shifts among industries and areas. Among the remaining socio-economic groups, the order of mobilities is consistently from occupational to industrial to geographical.

V. Errors and Biases of the Survey

A. Estimates of Sampling Errors

In order to evaluate the sampling errors in the context of the overall survey reliability, it is necessary to review the method of sampling that was used. It should be reiterated that the only data available at the time the survey sample was designed were 1940 block and census tract statistics. The observable growth of the City of Oakland in the intervening nine years and the shifting of population to newly-built areas presaged the inadequacy of the old data and led to a crude but nevertheless rational design. After the elimination of the high and low level census tracts which has been discussed before, the universe consisted of 55 tracts. All new blocks and subdivisions added since 1940 were drafted onto the block maps and the additional blocks were given numbers continuing the series for each tract. The assumption was made that the number of dwelling units was roughly proportional to the number of blocks in each census tract. Therefore random numbers of seven digits were drawn, the first two indexing the census tract, the next three indexing the block, and the last two indexing the block side. Since the census tract number and block number were fused, the tracts with fewer blocks had larger quantities of unusable numbers drawn and the proportionality with the number of blocks was maintained by the randomizing process.

The identification of the block sides presented no difficulty but it has since become clear that an element of heterogeneity was introduced by the use of clusters consisting of these block sides. Blocks in Oakland, and perhaps in other cities as well, are characteristically

rectangular; two block sides are short and two are long. The distribution of whole blocks by size shows more regularity than the distribution of block sides. Chart 2 compares the sizes of block sides drawn in the survey sample with the distribution of whole blocks obtained from the 1950 Census of Housing data for the same census tracts. The census distribution is skewed to the right, unimodal, and has no major irregularities in frequency other than the excess number of large blocks which are probably those containing large apartment houses. The Oakland Survey distribution has high frequencies at the low block sizes, and after decreasing, parallels the peak of the census data, decreasing in concordance with them, but with marked irregularity.

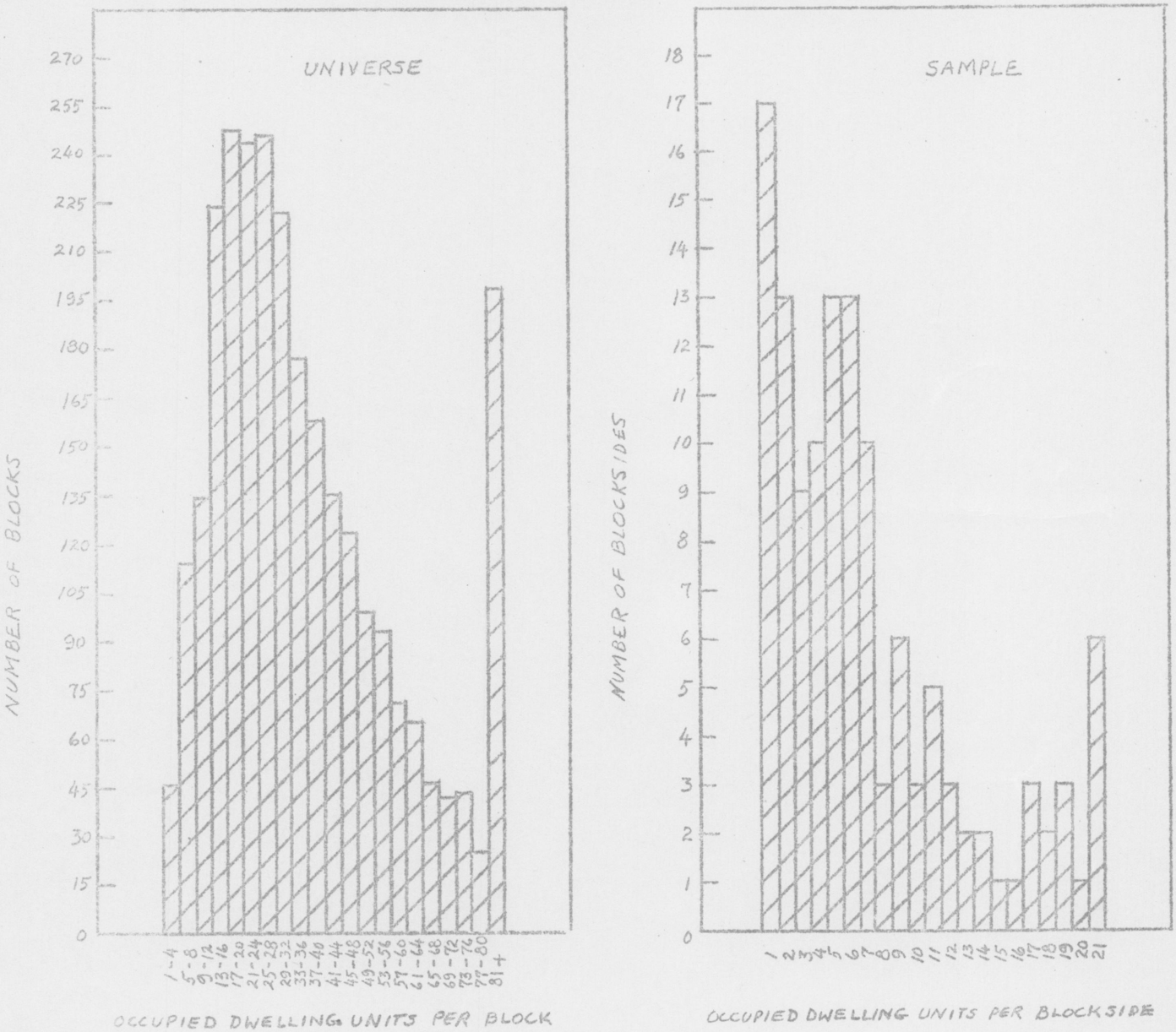
The sample which was drawn is explainable despite the apparent divergencies which are exhibited in Chart 2. For one thing, the 1950 census data do not include blocks containing fewer than 3 dwelling units. This accounts for the low universe frequency of the first column in the chart. In addition, when block sides are drawn, the short sides may be thought of as a separate distribution from that of the long block sides. The amalgamation of these two nonhomogeneous distributions results in the peculiar shape displayed by the sample block size distribution. The irregularities in the higher size blocks may be due to the low sampling ratio or the lack of formal control for multi-unit buildings.

The publication of the 1950 census data subsequent to the survey's completion enabled certain crude tests to be made regarding the randomness of the number and the sizes of block sides. The 55 census tracts included in the survey were ordered by size of tract and chi square tests were made to test (1) whether the number of block sides drawn in tracts

CHART 2

Frequency Distributions of Survey Sample

and of the Universe from which It was Drawn



was disproportionate with expectations based on tract size, and (2) whether the number of respondents surveyed was disproportionate with expectations regarding the number of dwelling units in the census tracts. Both of these tests showed that the obtained number of blocks and number of respondents did not materially depart from expectations. The probability levels of obtaining the survey distribution of block-side frequencies and block-side sizes were in the neighborhood of .50.

Having described the nature of the sample selection, it is appropriate to indicate the nature of the estimates which are predominately used in the analysis of the data and the sampling errors of these estimates[1] Most of the data have been analyzed as percentages formed by the

[1] W. E. Deming, Some Theory of Sampling (New York: Wiley and Sons, 1950), pp. 165-189, provided the sampling theory which has been adapted to the specifics of this survey.

aggregation of characteristics or coded responses divided by the total number in the sample. The relation of the sample design to this simple result is indicated in the following analysis:

Let x_i = number of persons having a particular characteristic in i'th cluster (blockside).

n_i = number of respondents in i^{th} cluster.

X = aggregate number of persons having a particular characteristic in whole sample.

N = aggregate number of respondents in whole sample.

Then,

$$(1) \qquad P = \frac{X}{N} = \frac{\sum_{i=1}^{m} x_i}{\sum_{i=1}^{m} n_i}$$

It can be easily seen that P is the weighted average of the cluster P_i's with weights proportional to the cluster sizes, i.e.,

$$(2) \qquad P = P_1 \cdot \frac{n_1}{\sum n_i} + P_2 \frac{n_2}{\sum n_i} + \ldots + P_n \frac{n_m}{\sum n_i}$$

$$P = \frac{x_1}{n_1} \cdot \frac{n_1}{\sum n_i} + \frac{x_2}{n_2} \cdot \frac{n_2}{\sum n_i} + \ldots + \frac{x_m}{n_m} \frac{n_m}{\sum n_i}$$

$$P = \frac{x_1}{\sum n_i} + \frac{x_2}{\sum n_i} + \ldots + \frac{x_m}{\sum n_i}$$

$$\text{or} \qquad P = \frac{\sum x_i}{\sum n_i} \text{ as in (1)}$$

Because of this inequality of weights, i.e., because of the differing sizes of clusters, only an approximation to the sampling error can be estimated. The percentages are in the nature of ratio estimates whose variances are:

$$(3) \quad \text{variance } P = \frac{M-m}{M} \frac{1}{m\bar{B}^2} \frac{1}{m-1} \sum_{i=1}^{m} (x_i - Pn_i)^2$$

where M = number of clusters in the universe

m = number of clusters in the sample

$\bar{B}$ = the average size cluster in the universe (for which an estimate based on the sample can be substituted)

x_i = number of persons having a particular characteristic in the i^{th} cluster

n_i = number of respondents in the i^{th} cluster

P = sample estimate of the proportion of persons having a particular characteristic.

In the variance estimating equation (3) the first term on the right side approximates unity because the sampling ratio of block sides was less than 1.5 per cent (126 clusters out of approximately 11,000). It has therefore been neglected in the calculations of the sampling error. Similarly, the next two factors have been combined into a scalar constant. Thirty variables have been processed to obtain the sums of the squared deviations and these sums have been multiplied by the scale constant to obtain the individual variances. After obtaining the square root of each variance estimate, these 30 estimates were plotted against their percentages. A curve was then fitted to these observations and represents a compromise among the individual percentage estimates which can be reasonably used for other percentages. The scatter of points around the line of regression was remarkably compact, the standard error of estimate being approximately .075 of one percentage point. (i.e., .00075)

In addition to the 30 estimates which were based on the aggregate of the whole sample, ten variables were selected in which the responses came from about 2/3 and 1/3 of the sample. Estimates of the sampling errors for these attenuated segments of the sample were also calculated. The results of this calculation are the sampling errors for portions of the sample rather than the total sample. All of these estimates are tabulated in the upper stratum of Table 10.

The second stratum of Table 10 presents estimates of sampling errors calculated for samples of the corresponding sizes but where simple random sampling rather than cluster sampling has been used. This comparison enables the relative efficiency of the cluster sampling design to be compared with that of simple random sampling. The index varies in the

Table 10--Approximate Sampling Variability of Percentage Estimates Based on Samples of Specified Sizes[1]

Size of Base	Percentage Estimate									
	5 or 95	10 or 90	15 or 85	20 or 80	25 or 75	30 or 70	35 or 65	40 or 60	45 or 55	50
1. Oakland Study										
935	1.5	2.2	2.7	3.1	3.4	3.6	3.8	3.9	4.0	4.1
670	2.1	2.7	3.2	3.6	4.9	4.2	4.3	4.7	4.6	4.7
335	3.2	3.7	4.1	4.5	4.8	5.1	5.4	5.6	5.8	5.9
2. Random Sampling										
935	1.4	2.0	2.3	2.6	2.8	3.0	3.1	3.2	3.3	3.3
670	1.7	2.3	2.8	3.1	3.3	3.5	3.7	3.8	3.8	3.9
335	2.4	3.3	3.9	4.4	4.7	5.0	5.2	5.4	5.4	5.5
3. Six-city--San Francisco data										
250,000	1.1	1.5	-	1.9	2.2	-	-	2.4	-	2.5
175,000	1.3	1.8	-	2.3	2.6	-	-	2.9	-	3.0
100,000	1.7	2.4	-	3.1	3.4	-	-	3.9	-	3.9

[1] All of the estimates in this table are at the 95 per cent level of confidence.

range 1.20-1.25 indicating that a loss in efficiency of approximately 20 to 25 per cent was incurred because of the particular kind of block side cluster sampling that was used in the Oakland Survey.

In the third stratum of Table 10 are presented those sampling errors calculated for the San Francisco data of the Six-City Study.[1] Data have been selected which are comparable with the universe size of the Oakland data, although it should be noted that the complete San Francisco sample amounted to 2260 respondents. Considering the differences in sample size, the results of these comparisons are in conformity with expectations. The Six-City data have sampling errors considerably smaller than the Oakland study. The size of these sampling errors is slightly smaller than would be expected on the basis of sample size alone indicating that the Six-City study sampling scheme was also responsible for some gains in efficiency relative to the design of the Oakland study.

[1] G. L. Palmer, Labor Mobility in Six Cities, (New York: Social Science Research Council, 1954), p. 163.

It was previously mentioned that the sample was designed to achieve a coefficient of variation of .10 at the 50 per cent level. Despite the loss in efficiency resulting from cluster sampling, the sample size was large enough to offset the loss and still exceed the planned standard; the actual coefficient of variation being .08 at the 50 per cent level.

B. Appraisal of Other Biases and Non-sampling Errors

Our final purpose will be achieved by recapitulating the observations that have been made in this chapter regarding the qualitative aspects of

the survey. Perhaps the greatest area of weakness was in the training and selection of the interviewers, and this was an element outside direct control of the survey planners once the decision to use student interviewers was made. The questionnaire contained several questions that proved difficult to code, and even more difficult to analyze. Of particular import in this context were the questions dealing with subjective reactions and preferences of respondents.

Errors in coding, punching, and card sorting which have materialized in the long period during which the data have been analyzed have been at a minimum. Apparently the more routine aspects of the survey processing have been relatively free from major biases.

The Oakland Labor Mobility Survey was one of several studies conducted in response to an increasing awareness of the significance of empirical studies of the labor market. These studies were conducted in several university industrial relations centers throughout the nation in 1948-49.

The culmination of these separate and uncoordinated approaches to the analysis of the labor supply mechanism was the standardized and simultaneous study in several labor markets, Labor Mobility in Six Cities.[1]

[1] Gladys L. Palmer, op. cit., 177 pp.

It was only this last study which clearly exceeded the methodological standards which have been described for the Oakland Study. With regard to sample design, sample size, availability of sampling errors, testing of the questionnaire, coding, and tabulating, the Oakland study can be considered a typical, independently conducted survey executed with some technical competence. A uniform quality of interviewers was not attained,

and this may have been a factor contributing to the magnitude of the non-responses. The proportion of non-responses reported earlier in this chapter constitutes the major weakness of the survey.

This frank appraisal of the quality of the Oakland Labor Mobility Survey has been presented, not in the hope of attaining absolution, but rather to contribute to the growing stock of data on survey methods. The university research center is in a much more advantageous position to make such an ex post evaluation of its research ventures, than is the private contract-seeking survey firm or even the government agency. In order to take advantage of this unique opportunity, we have set forth with candor and a minimum of glossy enamel the case history of a survey conducted by an interdisciplinary research team. May those that follow take heed. Their awareness of the problems which have been described will bring them closer to the methodological ideal.