ACTIVITY PATTERNS OF CALIFORNIA RESIDENTS

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DISCLAIMER

The statements and conclusions in this report are those of the contractor and not necessarily those of the California Air Resources Board. The mention of commercial products, their source or their use in connection with material reported herein is not to be construed as either an actual or implied endorsement of such products.

ABSTRACT

Retrospective time diaries were collected from a modified random sample of 1762 California residents aged 12 and over who were interviewed by telephone regarding all activities for the 24 hours of the previous day. Detailed information was also collected on the location of activities, on the presence of others smoking during the activity, and on socioeconomic and housing characteristics. Interviews were conducted with English-speaking households between October 1987 and September 1988.

On the average, adults and adolescents in California spent almost 15 hours per day inside their homes, and six hours in other indoor locations, for a total of 21 hours (87% of the day). About 2 hours per day were spent on transit, and just over 1 hour per day was spent in outdoor locations. The findings with respect to time spent in various activities were consistent with earlier national studies.

Percentages of the sample using or near specific potential sources of pollution at any time during the diary day (derived from a set of ancillary direct questions developed especially for this survey) varied from 5% being proximate to oil-based paints to 78% taking a hot shower and 83% using soaps or detergents. In addition, some 25% of all California adults (and 13% of 12-17 year-olds) said their jobs involved working near dust particles; another 20% said they worked with gasoline or diesel vehicles or equipment, and 20% with solvents or chemicals. Among the demographic factors that were found to predict greater opportunities for potential exposure were employment, gender and age.

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SUMMARY AND CONCLUSIONS

1. Introduction

Public exposure to environmental pollutants has been assessed in several ways. These include the placement of air monitoring equipment at specific locations and attachment of personal monitors to individuals so that personal exposure through the daily round of activities can be measured. Such studies are very expensive to conduct and are limited in the number of pollutants that can be monitored. Moreover, participants in such studies may engage in atypical daily behavior because of the presence of the monitoring equipment. For that reason other, and more cost-effective solutions to the problem of estimating public exposure have been sought.

By combining innovations in questionnaire design, such as time-diaries and time-budgets, with computer-assisted interviewing, it has been possible to produce reliable profiles of location/activity patterns for representative samples of the American public. When linked with information on air quality by location from other studies (e.g., pollutant concentrations in specific times and locations like rush-hour freeways) and interview data on potential exposures (e.g., presence of cigarette smoke in the home), such activity surveys enable more accurate estimates of public exposure to pollutants to be made.

The Air Resources Board (ARB) has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705. As a part of this program, the Air Resources Board commissioned the present study, "Activity Pattern Survey of California Residents," through a contract with the Survey Research Center, University of

California, Berkeley. The general objective of this study was to obtain statistically representative information regarding the time Californians spend in various locations and activities, especially those activities and locations that are likely to result in exposure to harmful air pollutants. More specifically the objectives of the staff in order of priority were as follows:

1. To determine the proportionate amount of time per day spent by Californians aged 12 and older as a whole indoors, outdoors, and in transit.

2. To determine the proportion of time spent in various indoor and outdoor locations (e.g., living room, workplace) and activities (e.g., working, cooking), by Californians in general, and by demographic and socioeconomic subgroups of Californians.

3. To compare the major results obtained for objectives 1 and 2 to comparable information for the entire U.S. population.

4. To determine the time spent in various indoor and outdoor locations and activities by Californians in three major geographic regions of the state through representative sampling in each region.

Such data are needed to provide more realistic and generalizable assessments of the health risks associated with specific pollutants.

2. Methodology

Preliminary versions of the questions to be asked of survey respondents were drafted in consultation with ARB research staff. After an extensive series of pretest interviews, a final questionnaire was

agreed upon, which consisted of questions related to four categories: a) personal background of the respondent, including age, education, area of residence, household income, and presence of children in the household; b) description of the respondent's living quarters, work conditions, and smoking behavior; c) potential exposures in the previous day to gasoline, gas stoves and ovens, paint products, pesticides, scented room fresheners, and the like; d) a time-diary of activities, locations, and presence or absence of others smoking for the twenty-four hour period beginning "midnight yesterday" on the day before the interview. Time-diary questions were designed to be open-ended, with activities (as named by the respondent) recorded in chronological order, along with the time each activity ended, where the activity occurred, and whether or not smokers were present during the activity. The activities were later coded using the activity coding scheme given in Table 2.4. To facilitate data analysis for the purposes of this report, an aggregated coding scheme consisting of twenty-six activities was also developed as shown in Table 2.5.

The target population for the general population survey of time-use was defined as all persons aged 12 and older living in households containing a telephone. The sample was generated using standard Waksberg random-digit dialing techniques with clustering. Prior to selection, all telephone exchanges in the state were grouped into three strata: Los Angeles and the south coast area ("South Coast Region), the San Francisco Bay Area ("S.F. Bay Area"), and the remainder of the state ("Other Areas of State). In order to spread the sampled households geographically throughout the state, the areas outside the Los Angeles

Basin were deliberately oversampled in the selection of clusters of telephone numbers.

Interviewing was conducted over the period October, 1987 through September, 1988, with the number of interviews roughly balanced over the four seasons. Within each selected household, one adult 18 or over was selected at random to be interviewed. Part of the adult interview included an enumeration of youths aged 12 to 17 residing in the household. If an eligible youth was identified, permission was sought from the appropriate parent or guardian to conduct a shorter interview with the youth. Interviewers collected diary information from approximately 62% of randomly selected respondents in eligible households, obtaining completed interviews from 1762 individuals. The distribution of the sample by age (12-17, 18 and older) and season of interview (October through December, January-March, April-June, and July-September) is shown in Table 2.8.

3. Major Findings

Data from the California Activity Pattern Survey were used to make a variety of estimates of how residents of the state of California use time. Among these are estimates of the time Californians spend:

a) At varying locations:

* Of the total of 1440 minutes per day, an average of 87% (1253 minutes per day) was spent in indoor locations, 5% in outdoor locations and 8% in travel. Of the average time spent indoors, more than two-thirds (893 minutes per day) was spent inside the respondent's home, with the bedroom (524 minutes) and living room (196 minutes) being the main rooms of the house where time was spent. Of the average

time spent indoors away from home, about one-third of the time was spent at places of work and other people's homes.

* The mean time spent in outdoor locations (excluding in-transit) across the sample across the year was 73 minutes per day, which translates to about 1.2 hours per day or 8.5 hours per week. This is about 5% of all time.

* The average time spent outdoors per participant was 157 minutes per day. For the population average, the outdoor location categories in which the greatest amount of time was spent (excluding in-transit locations) were "other outdoor" (33 minutes per day) and the yard of one's home (27 minutes per day). For participants, the mean times spent in these outdoor locations were 146 and 99 minutes per day, respectively.

* The mean time spent in travel was 111 minutes per day. Some 92% of the sample took at least one trip on the diary day and the mean time for those who did travel was 127 minutes per day. About two-thirds of travel time was spent in automobiles (73 minutes per day, 99 minutes per day per participant) and another 16% by vans or small trucks.

b) <u>In varying activities</u>:

Of the 1440 minutes in the sampled day, an average of 504 minutes (8.4 hours) was spent sleeping, 89 minutes eating, and 50 minutes engaging in personal care activities. The average time worked on the diary day for those who worked (46% of the sample) was 424 minutes per day (7.1 hours). For those who did the activity, 87 minutes was spent doing

house cleaning, 118 minutes per day traveling and 66 minutes per day shopping. The remaining time per participant in the average sampled day spent in leisure time and educational activities included 184 minutes for those who watch TV or listen to the radio or records, 115 minutes socializing, 104 minutes reading or writing, and 237 minutes in educational activities.

Findings for common activities which may involve use of, or proximity to, potential pollutant sources include the following:

* Average time spent cooking was 38 minutes per day, with more than half of the sample (51%) engaging in some cooking or meal cleanup activity on the diary day. Average cooking time per participant, then, was 75 minutes, with one respondent reporting a high of 465 minutes spent cooking on the diary day.

* Time spent doing house cleaning was a little higher (34 minutes per day) than for cooking, and with a higher standard deviation around the mean (74 minutes vs. 58 for cooking). There was a lower participation rate (39%), however, so that time per participant for cleaning (87 minutes) was much higher than for cooking.

* Another activity with high potential for exposure due to high concentrations of tobacco smoke is drinking or socializing at bars and lounges. Only 4% of the sample reported such activity, but the time spent per participant was 101 minutes.

c) In the presence of others smoking:

* The final question for each activity reported concerned the presence of others smoking during the activity. Based on weighted data from the nearly 37,000 activities that were reported in the diaries, the answer "yes" (other was smoking) was reported for 3404 activities or about 9% of them. The mean length of time per episode for those 3404 activities with others smoking was 84 minutes.

Based on weighted data, 62% of adults and adolescents were near others smoking during the diary day, and the average time such persons spent in activities with others smoking was 286 minutes. In addition, 22% of the adult sample said they had themselves smoked on the designated day, and 12% had smoked more than 10 cigarettes; cigar and pipe smoking on the sampled day was reported by less than 1% of the respondents.

The following percentages of respondents used, or were near the potential sources of pollutants listed below on the diary day

	Adults 18+	Ages 12-17
Soaps, detergents	83%	79%
Gas stove/oven on	39%	50%
Vehicle in attached garage	37%	na
Personal care aerosols	37%	66%
Scented room fresheners	31%	na
Household cleaning agents	27%	25%
Gas heat	27%	na
Toilet deodorizers	27%	na

At auto repair/gas station/ parking garage	26%	33%
Solvents	12%	12%
Mothballs	10%	na
Pumped or poured gasoline	16%	12%
Pesticides (all locations)	7%	5%
Glues or adhesives	7%	14%
Pesticides indoors	5%	4%
Water-based paints	5%	5%
Oil-based paints	5%	5%

na= not available

This brief summary indicates the wide variety of estimates that can be generated from survey data on durations of activities and location in the daily lives of California residents. Tables 1 and 2, showing average minutes per day in each of 44 locations and 26 activities, illustrate the level of specificity made possible by the time-diaries and suggest the variety of exposure estimates that might be constructed by linking the activity/location data with information about pollution sources. Such exposure rates can be estimated by region, season, socioeconomic status, and, subject to constraints of sample size, by any combination of variables included in the data set. Full and appropriate analysis of these data with the goal of estimating the most important kinds of public exposure to air pollutants, and their distribution within the California population, is an obvious first priority.

Table 1: MINUTES OF TIME SPENT IN DIFFERENT LOCATIONS

Number of Valid Observations (Listwise) = 1762.00

Variable	1. Estimated Population Mean	2. Std Dev	3. Doer** Mean	4.% Reporting Location	Maximum	N	Label
WC01	73.9	96.6	98	75%	930	1762	In Kitchen
WC02	196.3	205.0	246	80%	1340	1762	In Living Room
WC03	21.1	53.7	73	29%	880	1762	In Dining Room
WC04	32.9	53.4	45	74%	630	1762	In Bathroom
WC05	324.1	210.5	346	96%	1435	1762	In Bedroom
WC06	7.3	51.6	145	5%	1256	1762	In Study
WC07	9.1	55.7	97	9%	945	1762	In Garage
WC08	.4	7.3	79	1%	180	1762	In Basement
WC09	2.6	16.5	53	5%	380	1762	In Utility Room
WC10	.7	8.6	69	1%	230	1762	Pool, Spa
WC11	27.1	74.6	99	27%	840	1762	In Yard
WC12	21.8	60.1	89	24%	750	1762	Room To Room
WC13	3.7	32.1	60	6%	1015	1762	Other HH Room
WC01-13	921.1	307.2	934	99%	1440	1762	Total At Home
WC21	70.1	163.6	275	25%	725	1762	At Office
WC22	34.9	128.1	393	9%	750	1762	At Plant
WC23	12.4	52.4	56	22%	689	1762	At Grocery Store
WC24	33.8	97.7	124	27%	845	1762	At Shopping Mall
WC25	40.4	115.6	261	15%	724	1762	At School
WC26	13.2	65.7	173	8%	750	1762	Other Public Place
WC27	14.4	75.7	191	8%	840	1762	At Hospital
WC28	28.1	70.3	81	35%	885	1762	At Restaurant
WC29	8.0	49.5	174	5%	825	1762	At Bar-Nightclub
WC30	6.3	34.0	135	5%	395	1762	At Church
WC31	4.2	24.4	98	4%	395	1762	At Indoor Gym
WC32	60.6	155.2	200	30%	1440	1762	At Other's Home
WC33	10.5	65.7	91	12%	685	1762	At Auto Repair/Gas
WC34	12.3	57.1	149	8%	595	1762	At Playground/Park
WC35	6.7	58.6	308	2%	985	1762	At Hotel-Motel
WC36	.4	15.0	62	1%	580	1762	At Dry Cleaners
WC37	2.0	23.1	111	2%	510	1762	At Beauty Parlor
WC38	1.9	25.2	159	1%	630	1762	At Varying Locations
WC39	11.7	66.1	138	9%	945	1762	Other Indoor
WC40	33.2	103.0	146	23%	915	1762	Other Outdoor
WC21-40	405.0	272.4	441	92%	1440	1762	Total Away
WC51	73.3	83.1	99	74%	585	1762	In Car
WC52	17.9	55.4	102	17%	785	1762	In Van
WC53	9.9	26.8	38	26%	360	1762	Walking
WC54	.9	7.3	37	2%	187	1762	At Ride Stop
WC55	3.8	32.0	114	3%	1320	1762	On Bus
WC56	1.1	19.4	123	1%	395	1762	On Rapid Train
WC57	1.1	16.1	85	1%	548	1762	Other Truck
WC58	.6	11.3	130	*	315	1762	On Airplane
WC59	1.3	8.9	41	3%	160	1762	On Bicycle
WC60	1.2	13.9	62	2%	430	1762	On Motorcycle
WC61	.5	8.0	38	1%	270	1762	Other Transportation
WC51-61	111.4	107.9	122	92%	1320	1762	Total In Travel
WC99	2.5	24.4	133	2%	580		Unknown location
	73	138	157	46%	920	1762	Outdoors
	1253	178	1251	100%	1440	1762	Indoors
	111	108	122	92%	1320	1762	In-transit

* Less than 0.5%

** "Doer" refers to those who reported being in a given location.

Table 2

MINUTES OF TIME SPENT IN VARIOUS ACTIVITIES

Variable	Estimated Population Mean	Std Dev	Doer* Mean	% Reporting Activity	Maximum	N	Label
ACT1	88.7	69.4	93	95%	750	1762	EATING
ACT2	503.6	133.0	506	100%	1440	1762	SLEEPING
ACT3	193.6	241.4	424	46%	1200	1762	WORKING
ACT4	37.5	58.4	73	51%	465	1762	COOKING
ACT5	34.4	73.7	87	39%	630	1762	HOUSE CLEANING
ACT6	19.8	66.1	111	18%	780	1762	YARD WORK
ACT7	0.8	11.2	73	1%	170	1762	DRY CLEANERS
ACT8	108.5	104.4	118	92%	1320	1762	TRAVEL
ACT9	6.1	31.1	48	13%	535	1762	CAR REPAIR
ACT10	3.2	17.4	33	10%	480	1762	ANIMAL CARE
ACT11	18.3	53.1	79	23%	510	1762	CHILD CARE
ACT12	24.9	52.7	66	38%	480	1762	SHOPPING
ACT13	1.4	14.1	83	2%	390	1762	SERVICES
ACT14	7.5	27.1	41	18%	630	1762	ERRANDS
ACT15	50.3	61.0	58	87%	1170	1762	PERSONAL CARE
ACT16	45.7	120.5	237	19%	665	1762	EDUCATION
ACT17	15.7	45.6	88	18%	590	1762	ACTIVE SPORTS
ACT18	10.7	49.3	134	8%	540	1762	OUTDOOR RECREATION
ACT19	5.1	29.3	114	4%	435	1762	HOBBIES
ACT20	2.8	21.3	106	3%	270	1762	SINGING/DANCING
ACT21	9.5	44.4	143	7%	555	1762	CULTURAL EVENTS
ACT22	55.5	94.9	115	48%	730	1762	SOCIALIZING
ACT23	3.7	22.8	101	4%	330	1762	BAR AND LOUNGES
ACT24	143.1	145.3	184	78%	1065	1762	ELECTRONIC MEDIA
ACT25	47.6	96.0	104	46%	1050	1762	READING, WRITING
ACT26	2.3	15.6	29	8%	450	1762	OTHER

*"Doer" refers to those who reported participating in a given activity.

This project has developed a useful set of data which, when combined with other data, can be used to estimate the potential exposure of residents of the state of California to various sources of pollution. The methodology and data from this project can now be used in conjunction with other data, including data from personal exposure monitoring studies that have generated exposure levels for various microenvironments, to estimate potential exposure levels of the population across the state.

In order to facilitate presentation of the main findings of the California Activity Pattern Survey, we have relied mainly on summary measures of the average time spent in each of many locations and activities, and we have confined our analysis of these measures to the study of their variations among major population subgroups. Additional analyses of the survey data should be conducted, with special attention to a) more refined indices of time use (including median time or percentages of the population above a certain criterion level) that are more directly associated with potential exposure to pollutants, b) additional significance tests for direct, well-defined hypotheses, and c) more complete multivariate descriptions of the variation in such indices by examining <u>combinations</u> of predictor variables.

New indices of time use relevant to potential pollutant exposures can be created from the activity data file through <u>aggregations</u> or disaggregations of various components of the diary reports. Because each report can be classified by activity type (100+ codes), location (44 codes), presence or absence of others smoking, duration, and time of day, there are literally thousands of possibilities for creating new

variables. As a practical matter, it will be most useful to begin this process by identifying groups of activities and locations that are known to be associated with specific pollutants. Thus, for example, by computing the aggregate time (over activities and locations) that nonsmokers spend in the presence of smokers, an index of potential exposure to others smoking can be generated for each non-smoking respondent. It should also be possible to construct similar aggregate indices for potential exposure to carbon monoxide, ozone, and so on. For certain purposes it may be important to construct indices which preserve greater detail. For example, in examining the potential for exposure to pollutants associated with automobile travel, time-of-day may be as important as duration of travel.

The development of a more ambitious set of multivariate analyses and computer models for use with this data set should also be very high on the priority list of next steps for analyzing the data in this project. Toward this goal, multiple regression analyses are especially recommended in isolating the most important predictor variables and gauging their import once other factors are taken into account. For example, differences by region may well be greatly affected by age, education or employment status differences of people in that region.

That is a step that has been designed to be done rather straightforwardly with the extensive computer tapes and files that have been generated from this project. These have the features both of being user-friendly and of allowing extremely complex and subtle models of potential population exposure to be tested with the data.

There are several other areas in which more generalizable data could be useful as well:

-- Larger sample sizes in particular geographical areas of interest (e.g., areas of high acid rain or with known nearby pollutant sources);

-- Larger sample sizes for "at risk" populations, such as asthmatics or automobile mechanics;

-- Potential exposure to additional pollution sources;

-- Longer periods of reporting time than a single day, such as a week or a month. While it is difficult to maintain high response rates over these longer periods of time, some methods of time sampling could be developed to ease respondent burden -- as was done in the 1975-81 University of Michigan study of Juster and Stafford (1985), in which respondents were interviewed for up to eight separate days across a two-year period.

-- Longer periods of study design, such as every 5 or 10 years, in order to monitor changes in the public's activity patterns. While most time-use estimates remain fairly steady across time, national time-use data, for example, show significant changes in travel behavior between the 1965 and 1975 and again between 1975 and 1985.

Finally, there is need to conduct further methodological studies to enhance the validity and applicability of the data. Like earlier time-diary studies, this one achieved a "degree of resolution" of activity description that yielded 20-25 daily activities, or about 1.5 activities per waking hour. It is not clear how much more valid or useful results would be obtained if a higher degree of resolution could be achieved. For example, in Robinson's (1985) validity study using the "random hour" technique, respondents described two to three times as many activities during a randomly-chosen hour during the day than what they had previously described for that hour in their 24-hour diaries. However, the overall average times in each activity with this higher degree of resolution was little different from that obtained with the full 24-hour diary. It appeared as if those people who reported too much of an activity (e.g., housework) in the diary vis-a-vis the random

hour were offset by other people who reported too little housework in the diary.

That general result should be retested for specific activities of paramount interest to environmental researchers. Due to lack of probing and/or respondent cooperation, for example, the degree of time resolution (The shortest time period reported for any activity) achieved for some of the diaries was not as great as for others. Therefore, detailed information was not always obtained for brief or infrequent activities, e.g., short travel episodes. Thus, time spent in outdoor locations could be significantly underrepresented by these and similar omissions in the diary with its current degree of resolution. At the same time, underreported times in outdoor locations could be offset by some corresponding upward reporting bias in relation to some indoor activity. A very carefully designed and precisely executed validity study would be needed to determine the extent of such biases, or offsetting biases.

There is, of course, the matter of the many pollution sources that could not be examined in the present study or examined only briefly. Questions regarding them would have to be very detailed and specific. One could easily imagine an entire survey, for example, to deal with exposure to particulate pollutants, volatile pollutants, or their major sources. In addition, diary studies can be conducted in close conjunction with studies using personal exposure monitors in a way that one can directly relate exposure to specific activities. The approach developed in this project can and should be easily adapted to such purposes, and our data can be used to greatly inform the overall study design and sharpen the research hypotheses of such efforts.

CHAPTER I. PURPOSE, BACKGROUND, AND SYNOPSIS OF RESEARCH DESIGN

1. Purpose of the Study

Public exposure to environmental pollutants has been assessed in several ways. These include the placement of air monitoring equipment at specific locations and attachment of such devices to individuals so that personal exposure through the daily round of activities can be measured. The latter method more realistically simulates the intake of pollutants by individuals than the former, but such studies are very expensive to conduct, are limited in the number of air pollutants that can be monitored, and are likely to encounter problems in eliciting participation from representative samples of individuals. Moreover, participants in such studies may engage in atypical daily behavior because of the presence of the monitoring equipment. For that reason, more cost-effective alternatives to the problem of estimating public exposure have been sought.

By combining innovations in questionnaire design, such as time-diaries and time-budgets, with computer-assisted interviewing, it has been possible to produce reliable profiles of location/activity patterns for representative samples of the American public. When linked with information on air quality by location from other studies (e.g., air quality data from specific times and locations like rush-hour freeways) and interview data on personal exposures (e.g., presence of cigarette smoke in the home), such activity surveys enable a more accurate estimate of potential public exposure to pollutants to be made.

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1. To determine the proportionate amount of time per day spent by Californians aged 12 and older as a whole indoors, outdoors, and in transit.

2. To determine the proportion of time spent in various indoor and outdoor locations (e.g., living room, workplace) and activities (e.g., traveling, cooking) by Californians in general, and by demographic and socioeconomic subgroups of Californians.

3. To compare the major results obtained for objectives 1 and 2 to comparable information for the entire U.S. population.

4. To determine the time spent in various indoor and outdoor locations and activities by Californians in three major geographic regions of the state through representative sampling in each region.

Such data are needed to provide more realistic and generalizable assessments of the health risks associated with specific pollutants.

2. The Precedent for and Validity of Time Diary Surveys

The California Activity Pattern Survey implements a relatively new methodology for studying the distribution of activities and locations which may expose individuals to harmful pollutants. However, the core element of this methodology - the collection of time-diary information in the context of probability-based surveys - has been employed in several earlier surveys conducted for other reasons. In what follows, we provide a brief review of these surveys along with a discussion of what is known about the validity of the time-diary information collected from the survey participants.

Prior to the California study, five national time-diary studies had been conducted using this general approach. These five studies and the organizations involved are as follows:

Mutual Broadcasting Corporation (1954) study, in which more than 8,000 American adults 15-59 kept time diaries for a two-day period (more exact details are given in De Grazia, 1962).

Survey Research Center, University of Michigan (1965) study, in which 1,244 adult respondents aged 18-64 kept a single-day diary of activities, mainly in the Fall of the year; respondents living in rural areas and non-employed heads of households were excluded (Robinson, 1977).

Survey Research Center, University of Michigan (1975) study, in which 1519 adult respondents aged 18 and over kept diaries for a single day in the Fall of that year (Robinson, 1976); in addition, diaries were obtained from 788 spouses of these designated respondents. These respondents became part of a panel who were subsequently reinterviewed by telephone in the Winter, Spring and Summer months of 1976; about 1500 respondents remained in this four wave panel. Some 677 of these respondents were reinterviewed in 1981, again across all four seasons of the year (Juster and Stafford. 1985).

Survey Research Center, University of Maryland (1985) study, in which single-day diaries were collected from more than 5000 respondents aged 12 and over across the entire calendar year of 1985. Three modes of diary collection were used for comparison: personal, mailback and telephone, with little difference in obtained estimates (Robinson and Holland 1988).

Survey Research Center, University of Maryland (1987) study, which by intent was designed specifically to be compatible with 1965, 1975 and 1985 studies and thus to continue these earlier efforts to measure trends in time use across the last 30 years. The 1987 study made the full transition to the telephone mode of interviewing, which is less expensive and generally produces equivalent results to the other ways of collecting diary data. Some 500 respondents were interviewed.

Time diary estimates thus far have been found to produce rather reliable and replicable results at the aggregate level. For example,

* Robinson (1977) found a .95 correlation between time use patterns found in the 1965-66 national time diaries (n=1244) and the aggregate figures for the single site of Jackson, Michigan (n=788). Similar levels of correspondence were found for other countries in the multinational time-use study (Szalai et al., 1972) in which two separate sites per country were examined.

* Similar high correspondence was found for the American data and for time-diary data from Canada, both in 1971 and in 1982 (Harvey and Elliot 1983).

* A correlation of .85 was found between time expenditure patterns found in the U.S.-Jackson time study using the "day after" approach and time expenditure for a random tenth of the samples who also filled out a "day before" diary. In a smaller replication study in Jackson in 1973, an aggregate correlation of .88 was obtained. Similar high correspondence was found in the other countries in the multinational study (Szalai et al., 1972).

Several studies bear more directly on the validity of the time diary, in the sense of there being an independent source or quasi-observer of reported behavior. The first of these studies did not involve the time diary directly, but rather the conclusion from the time diaries that standard television rating service figures on TV time expenditure provided high estimates of viewing behavior. In this small scale study (Bechtel, Achepohl and Akers, 1972), the TV viewing behavior

of a sample of 20 households was monitored over a week's time by means of a video camera; the camera was mounted on top of that set; thus the video camera/microphone recorded all behavior in front of the TV screen.

The results of this study, as in the earlier camera monitoring of TV audiences by Allen (1968), verified that both rating-service methods of TV exposure (the audimeters and the viewing diaries) produced estimates of viewing that were 20 to 50 percent higher than primary or secondary activities reported in full.

Three more general validity studies subsequent to Bechtel et al. provided further evidence bearing on the validity of time diary data. These examined the full range of activities and not just television viewing and employed larger and more representative samples. In the first study (Robinson 1985), a 1973 random sample of 60 residents of Ann Arbor and Jackson, Michigan kept beepers for a one-day period and reported their activity whenever the beeper was activated (some 30 to 40 times across the day); the correlation of activity durations from the beeper and from the diaries was 0.81 for the Ann Arbor sample and 0.68 for the Jackson sample (across the non-sleep periods of the day). A second study, which involved a national telephone sample of 249 respondents (Robinson 1985), found an overall correlation of 0.81 between activities reported in "random hours" and in time diary entries for those same random hours.

In a more recent study, Juster (1985) found the "with whom" reports in the 1975-76 diaries of respondents agreed with those of their spouses in more than 80% of the diary entries. In a separate analysis

of these 1975 data, Hill (1985) found a 0.93 correlation between time spent on various home energy-related activities and aggregate time-of-day patterns of energy use derived from utility meters.

3. Synopsis of the Research Design Used for the California Activity Pattern Survey

Time-use data collection procedures were applied to a probability cross-section sample of 1762 California residents aged 12 and over to provide detailed, generalizable data on:

* Time spent in various locations, with special attention given to time spent outdoors and in transit -- as well as specific locations like living rooms or kitchens in the home, or in automobiles or buses.

* Time spent in various activities, initially broken down into about 100 discrete types of activities, such as cooking or playing sports.

* Time spent on one or more associated facets of daily activities that have implications for air pollution exposure (e.g., presence of smokers, cooking equipment, use of solvents, etc.).

The basic features of the research design are summarized below:

* We selected a strict random probability sample of California households with telephones sufficient to obtain diary data from 1762 individuals aged 12 and older selected randomly. The sample was stratified by region to increase sample representativeness and precision in rural areas.

* Interviews were conducted over four study periods by season: October-December, January-February, March-April, and July-September.

* Eligible respondents in the selected households were chosen strictly at random, and not by convenience or willingness to participate (two factors that could introduce serious biases into the sample for activity estimation purposes).

* Interviewers conducted diary interviews with respondents in an estimated 62% of eligible households, with at least 10 call-backs made to each non-responding household at diverse times of the day or week. Business and other non-residential telephone numbers were identified and excluded from this random-digit-dial sample.

* Interviewers were extensively trained to use established telephone diary methods from past national studies to help

respondents report on their daily activities for the previous day. These diaries included information on primary activities, location, and presence of smokers.

* These diary data were coded, checked and edited to ensure that a full 24 hours of activity were represented. Editing procedures utilized the unique capabilities of the University of California at Berkeley CATI system, with its extensive network of cross-checks and recoding features for complicated data sets. The raw variable-field diary data were retabulated into fixed-field format to allow straightforward analysis by statistical programs such as SPSS or SAS.

* These fixed-field diary data were merged with that individual's demographic and geographic background data (sex, age, income, occupation, household structure, zip code) including two of the major predictors of time use, namely, employment status and education (Robinson, 1977).

CHAPTER II. METHODOLOGY

1. Introduction

The purpose of this chapter is to provide a concise account of the procedures that were used to conduct the 1987-88 California Activity Pattern Survey. This account is divided into six sections. Sections 2-4 discuss the sampling design and execution, the design of the questionnaire portion of the interview and its implementation under the CATI (i.e., Computer-Assisted Telephone Interviewing) system, and the training and supervision of the interviewers. The section on sampling is an abbreviated version of "Sampling Methods for the 1987-88 California Activity Pattern Survey" (May, 1989) by Dr. Thomas Piazza and Ms. Yu-Teh Cheng. The reader is referred to that document (attached as Appendix D) for a more complete description of the sampling methodology.

The California Activity Pattern Survey is, to our knowledge, the first attempt to collect information about the daily activities of a probability sample of Californians using a computer-assisted, interviewer-administered diary of daily activities. Section 5 of this chapter describes this procedure in some detail, and includes a discussion of how the diary questions were asked and how the responses were recorded under the CATI system. Because the format of the diary portion of the interview is open-ended, the construction of a coding scheme for categorizing the recorded responses is a crucial part of the survey methodology. The coding scheme and the collapsed codes used to generate data for this report are also discussed in Section 5.

Finally, section 6 summarizes the "field outcomes" of the survey operation, including the distribution of the sample over season of

interview, the overall response rates obtained, and the extent to which the sample can be said to "represent" the target population --- i.e., non-institutionalized English-speaking California residents aged 12 and over --- at the time the survey was conducted.

2. Sample Design

The sample is a clustered random-digit telephone sample of all households in California with a telephone. The sample was generated using procedures described by J. Waksberg ("Sampling Methods for Random Digit Dialing," *Journal of the American Statistical Association*, vol. 73, March 1978, pp. 40-46). Households with no telephone, of course, are excluded. Households with no English-speaking adults were also excluded by design, in order to avoid the cost of translating the questionnaire and hiring bilingual or multilingual interviewers.

Prior to selection, all of the telephone exchanges in the state were grouped into three strata: Los Angeles and the South Coast ("South Coast Region"), the San Francisco Bay Area, and the rest of the state ("Other Areas of State"). When clusters of telephone numbers were selected for the study, the sampling fraction was doubled for the Bay Area, in comparison with Los Angeles and the South Coast; the sampling fraction was doubled again for the rest of the state. This oversampling was carried out in order to spread the selected households more widely over a variety of climatic zones and geographic areas.

Within each selected household, one adult aged 18 or over was selected at random to be interviewed. Part of the adult interview included an enumeration of youths aged 12 through 17 residing in the household. (Younger children were excluded for budgetary reasons and because we anticipated that modifications would have to be made in the

methods of collecting time diary data for younger children. A survey of such children is currently underway.) If a youth aged 12 to 17 resided in the household, permission was sought from the appropriate parent or guardian to administer a shortened version of the interview to the child. If more than one youth in that age range resided in the household, one youth, referred to as the "youth respondent," was selected at random to be interviewed.

One objective of this study was to obtain information from households in a wide variety of geographic areas. Since most of the California population is clustered in a few metropolitan areas, an unrestricted random sample would result in the completion of very few interviews in other more sparsely populated, but geographically diverse, areas of the state. A stratification of all the telephone exchanges in the state was carried out, therefore, in order to provide a means of oversampling the non-metropolitan areas and of distributing the sample over as many regional areas as possible. Three sample strata were used: the South Coast area, comprising the Los Angeles air basin and San Diego County; the San Francisco Bay Area air basin; and all remaining California prefixes (i.e., those prefixes for areas outside the South Coast or San Francisco Bay Area). More detailed information about sample stratification is given in Appendix D.

Within each of the three major strata we selected a certain proportion of possible telephone numbers by systematic random sampling -- that is, by setting a selection interval, taking a random start, and then selecting every nth number. The proportion of telephone numbers selected from each major stratum is shown in Table 2.1. In the South

Coast stratum, for example, we selected 194 out of 1532 prefixes (each of which has 10,000 possible telephone numbers), or 0.127 of the prefixes. The proportion selected was doubled for the San Francisco Bay Area, and doubled again for the rest of the state. Without such disproportionate selection, the sample would have been clustered primarily in a few large urban areas.

After the primary telephone numbers were selected, each was called and administered a short screening interview to determine if the number was a residence. If it was not, that cluster was dropped from the sample. If, on the other hand, the number was a residence, additional telephone numbers within that cluster were generated for the main study. Of the 936 original telephone numbers, 252 were determined to be residences and formed the clusters for our sample.

The telephone numbers within each cluster were generated by varying at random the last two digits of the primary number. For example, if the primary number for a cluster was (415) 642-6578, additional telephone numbers within the cluster were generated by replacing the "78" with one of the 99 other two-digit possibilities.

Under the clustered sampling procedure, a set of telephone numbers is prepared for interviewing from each cluster. If a telephone number turns out to be non-residential, it is replaced. Consequently, the total number of residences in each cluster remains fixed. The probability of selecting a household is constant across clusters (within major strata), provided that the same number of residential telephone numbers has been set up for interviewing. For this study, most clusters had 11 residential numbers, although a few clusters had a different number.

Table 2.1

SELECTION OF PRIMARY CLUSTERS

	No. Prefixes	Selections	Fraction of Prefixes Selected
Major Stratum			
South Coast Region	1532	194	.127
S.F. Bay Area	759	192	.253
Other Areas of State	1085	550	.507
	3376	936	.277

Because the sample design involved stratification, clustering, and unequal distribution of interviews over season and day of the week, the sample data may need to be weighted in various ways in order to produce unbiased estimates of population characteristics. Such weights have been computed to adjust for unequal probabilities of selection (by strata and for households of different size) and to balance results by season and day of the week. The weights are defined and discussed fully in Appendix D and given in specified locations on the data file.

3. The Questionnaire.

The questionnaire was designed to be in four basic sections. The first introductory part collected basic data on the respondent's living quarters, work conditions and smoking behavior. The second part consisted of the time diary for the previous day. The third part examined activities and locations for the previous day related to potential exposures from gasoline engines, stoves, paint products, pesticides, room fresheners and the like. The fourth and concluding part concerned background of the respondent -- age, education, area of the state, household income and presence of children. Children aged 12-17 responded to the same questions as the adults, with the exception of the general household questions which had already been answered by an adult.

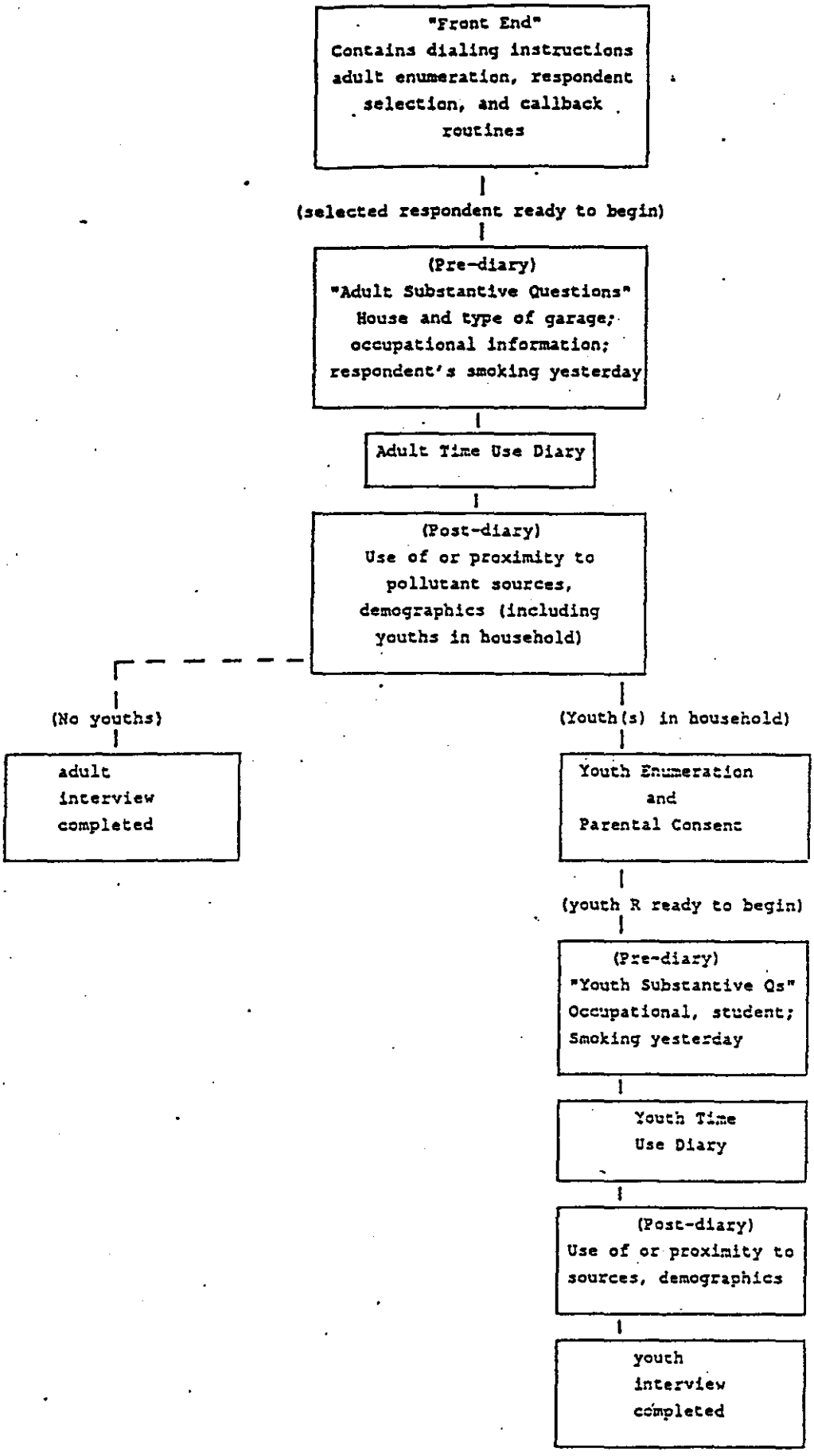
One special feature of these questions was that they were asked using the state-of-the-art CATI technology developed at the University of California at Berkeley. That technology a) allows one question on the interviewer's "screen" at a time; b) permits automatic "branching" responses so that, for example, follow-up questions are only asked of respondents who said they had experienced some form of potential

exposure; c) eliminates any closed-ended responses that are not pre-coded as eligible codes; and d) allows automatic coding onto a computer tape, thus reducing the need for human coding (with its multiple possible sources of error).

The branching features of the UC Berkeley CATI system were particularly useful given the large number of "skip patterns" for respondents who did not work, smoke or have children in their households. These can be seen in the instructions after various questions in the questionnaire shown in Appendix B.

A schematic diagram illustrating the flow of the adult and adolescent interviews is shown in Figure 2.1. The top of the figure shows the "front end" of introductory information to identify the respondent, followed by the pre-diary questions on occupation and smoking behavior, the diary and the post-diary data on other pollutants and finally respondent demographics. The bottom part of the diagram shows this similar flow of questions if there was an adolescent in the household.

Of particular importance for the present study were the specific ancillary questions related to activities which could potentially result in pollutant exposure and which may not have been covered in the diary. Respondents may not have thought of these activities in describing their previous day, or may have given priority to some other aspect of the activity. After completing the diary, respondents were asked whether they spent time at a gas station, parking garage or auto repair shop, whether they pumped gasoline, cooked with gas, etc., and other similar questions. All together, activities related to almost 20 different potential pollution sources were probed (see Figure 2.2 sequence).


"Front End"
Contains dialing instructions adult enumeration, respondent selection, and callback routines
(selected respondent ready to begin)
(Pre-diary)
"Adult Substantive Questions"
House and type of garage; occupational information; respondent's smoking yesterday
Adult Time Use Diary
(Post-diary)
Use of or proximity to pollutant sources, demographics (including youths in household)
(No youths)
adult interview completed
(Youth(s) in household)
Youth Enumeration and Parental Consent
(youth R ready to begin)
(Pre-diary)
"Youth Substantive Qs"
Occupational, student; Smoking yesterday
Youth Time Use Diary
(Post-diary)
Use of or proximity to sources, demographics
youth interview completed

These follow-up questions, then, added much more specific and complete information to the data set regarding activities and locations of the sample population which are most often associated with pollutant exposures.

These questions were developed with the aid of the Scientific Advisory Panel that reviewed the proposed instruments and provided comments on their completeness and accuracy -- as well as their ability to achieve the scientific goals set for the project. This Advisory Panel was comprised of leading national experts in the air pollution field. They are identified in Appendix C.

4. Interviewer Training and Supervision

Prior to the briefing session concerned with procedures specific to the California Activity Pattern Survey (CAPS), all interviewers completed a training session in basic interviewing techniques and training in the use of CATI. As is true for all SRC studies, a manual for interviewers working on the CAPS study was prepared. This manual included a description of the background and purpose of the study, instructions on how to obtain information in diary format, detailed instructions on how to handle each question in the interview, and instructions on how to handle common problems or ambiguities that could arise in the interview. Prior to the briefing session, interviewers were required to study this manual. The briefing for the study took place over two days and involved some discussion of the objectives of the study and considerable time conducting practice interviews in the group session. These practice interviews are used to instruct interviewers in procedures for handling specific questions as well as difficulties that might arise. Once SRC supervisory staff were

FIGURE 2.2

EXPOSURE QUESTIONS BEFORE DIARY

>wp1<	Does your job involve working on a regular basis, that is, once a week or more often, with:
	Gas stoves or ovens?
>wp2<	Open flames?
>wp3<	Solvents or chemicals?
>wp4<	Dust or particles of any sort?
>wp5<	Gasoline or diesel-powered vehicles or work equipment?
>wp6<	Other air pollutants?
>smok<	Did you smoke any cigarettes yesterday--even one?
	(If yes) Roughly, how many cigarettes did you smoke yesterday?
>smoke<	(CODE OR ASK AS NEEDED) Did you smoke any cigars or pipe tobacco yesterday?
	(If yes) Roughly how many cigars or pipes of tobacco did you smoke yesterday?

EXPOSURE QUESTIONS AFTER DIARY

	Just to be sure we didn't miss any important information, I have some additional questions about yesterday's activities. Did you spend ANY time yesterday at a gas station or in a parking garage or auto repair shop?
>pgys<	(If yes) About how long in all yesterday did you spend in those places?
>pgas<	Did you pump or pour any gasoline (yesterday)?
>gstv<	Did you spend any part of yesterday in a room where a gas range or oven was turned on?
>nstv<	Were you around more than one gas range or oven yesterday, or only one?
>ms1<	Was the gas range or oven you were around for the longest time yesterday being used for cooking, for heating the room, or for some other purpose?
>mstm<	Roughly how many minutes or hours IN ALL were you in rooms where gas ranges or ovens were turned on (yesterday)?

Continued

FIGURE 2.2 (Continued)

>ms2<	Does the oven or range that you were around the longest have a gas pilot light or pilotless ignition?
>gspr<	Was the gas range or oven being used for cooking, for heating the room, or for some other purpose?
>htf1<	What kind of heat was it --gas, electricity, oil, or what? (IF COMBINATION; Which kind did you use most?
>heat<	What type of heater was turned on for the longest amount of time? Was it a wall furnace, a floor furnace, forced air, radiator, space heater, or something else?
>open<	Were any doors or windows in your home open for more than a minute or two at a time yesterday?
>opn1<	For about how long during the day, that is, from 6 a.m. to 6 p.m., (were they/was it) open?
>opn2<	For about how long during evening or night hours, that is, from 6 p.m. to 6 a.m., (were they/was it) open?
>fan1<	Did you use any kind of fan in your home yesterday?
>fan2<	Was that a ceiling fan, window fan, portable room fan, or something else?
>airc<	(Other than the fan you just mentioned) Did you use any kind of air cooling system in hour home yesterday, such as an air conditioner?
>ACtp<	What type is it? <1> Evaporative cooler (swamp cooler) <5> Refrigeration type (air conditioner) <7> Other (SPECIFY)
>glue<	Did you use or were you around anyone while they were using any of the following yesterday: Any glues or liquid or spray adhesives? (NOT INCLUDING ADHESIVE TAPE)
>pnt1<	(Did you use or were you around anyone while they were using:) Any oil-based paint products (yesterday)? <1> Yes <5> No

Continued

FIGURE 2.2 (Continued)

>pnt2<	Any water-based paint products (yesterday)? (ALSO KNOWN AS "LATEX PAINT")
>solv<	Any solvents (yesterday)?
>pest<	Any pesticides (yesterday) such as bug strips or bug sprays?
>pst2<	When you were around pesticides yesterday, were you mostly indoors or outdoors?
>soap<	Any soaps or detergents (yesterday)?
>Ocln<	Any other household cleaning agents such as Ajax or ammonia (yesterday)?
>shwr<	Did you take a hot shower yesterday?
>bath<	Did you take a hot bath or use an indoor hot tub yesterday?
>moth<	Are you currently using any of the following in your home: Any mothballs, moth crystals, or cakes?
>deod<	Any toilet bowl deodorizers?
>rmfr<	Any SCENTED room fresheners?

satisfied that interviewers understood study procedures, interviewers began interviewing. During the early phases of data collection, supervisors closely monitored interviewer performance by listening in on their conversations with respondents. These early interviews were carefully reviewed with each interviewer, with the supervisor pointing out those areas where interviewer performance could be improved. Throughout data collection, approximately fifty percent of the interviews were monitored by supervisory staff. Weekly reviews were conducted with each interviewer to insure that proper procedures were followed. Diaries with fewer than ten or fifteen activities were discussed with interviewers to make sure that adequate probing had occurred.

5. Diary Procedures and Coding

a. The Daily Diary

In contrast to most surveys which examine people's activities in isolation from the natural temporal context in which they are embedded (e.g., by asking people to compress their actual behavioral experiences by saying whether they "often" or "usually" do something), time-diary activity accounts report activities as they naturally and sequentially occur in daily life. Studies of time use provide us the opportunity, then, to study human activities in "real time" -- as individuals are actually involved in the stream of daily behavior.

Time diaries can be seen as a prime example of the "micro-behavioral" approach to survey research. This micro-behavioral approach recognizes the limited ability of respondents to report very complex behavior in a survey context. Thus, most survey questions are limited

to the most elementary experiences about which respondents can accurately report. The micro-behavioral approach also provides researchers with a more basic and flexible data base from which to draw conclusions about human activity.

The time diary is a micro-behavioral technique for collecting self-reports of an individual's daily behavior in an open-ended fashion on an activity-by-activity basis. Individual respondents reported such activity accounts for a short, manageable period, namely the full 24 hours of a single day. In that way, the technique capitalized on the most attractive measurement properities of the time variable; namely, completeness, equal distribution and understandability. Thus,

a. all daily activity is potentially recorded (including that which occurs in early morning hours when most "normal" people may be asleep);

b. all 1440 minutes of the day are equally distributed across respondents (thus allowing certain "trade-offs" between activities to be examined); and

c. respondents are allowed to use a time frame and accounting variable that is maximally understandable to them and accessible to memory.

The open-ended nature of activity reporting means these activity reports were automatically geared to detecting new and unanticipated activities, (e.g., aerobic exercises, use of new communications technologies), as well as capturing the context of how daily life is experienced.

In the retrospective diary used in the California study, respondents reported each activity they engaged in, and in addition, where they were, and whether others smoking were present during the activity. Each respondent was first asked to report the activity in which they were engaged at midnight on the preceding day. They were asked "Where were you when you were doing (ACTIVITY)?", and then asked,

"Were you around anyone who was smoking a cigarette, cigar or pipe?". The final question for that activity was, "What time did you finish (ACTIVITY)?". The next question, "What did you do next?", introduced the same series of questions for subsequent activities until reaching an activity that lasted until midnight of the following day.

Considerable research effort was invested in obtaining a very detailed account of activities during the day -- one that includes all the important changes that occur during the day. Through prompts and probing, the interviewer attempted to ensure that each respondent's report was complete and accurate. The restricted sequential approach of the diary reminded respondents of the need for detail and consistency in activity reporting. The diary task instead is one in which respondents have minimal opportunity to give superficial or distorted responses, or responses that they perceive will somehow "please" the interviewer. With at least 20 to 30 activities to recall and report on for a particular day, the respondent's attention is kept very focused.

b. Utility of CATI-Based Diaries

The value of having the diary on CATI was evident in several ways. First, the interviewer could concentrate on only one facet of reporting at a time, either the main activity, the location, the times began and ended, or the presence of smokers. Second, the open-end features of CATI made it possible for the interviewer to transcribe the respondent's descriptions of each activity directly into the computer (a feature that was particularly important for subsequent coding as noted below). Third, most locations were pre-coded, depending on whether the activity was done at home, away from home, or in transit (using the detailed breakout of locations in Table 2.2); note that an open-end set of

"other" categories were also included to handle responses that did not fit into the categories. Fourth, the smoker present-or-absent question was also pre-coded for easy recording.

The CATI program also made it relatively easy for respondents who had forgotten an activity to "jump back" and have that activity inserted in its proper place in the flow of the diary. The same was true for the "wrap-up" question at the end of the diary -- which directly asked respondents if there were any activities that they had forgotten to report ("Thinking back over the 24 hour period we've just been talking about, is there anything else that happened within, before or after that period?"). Several additional activities were also generated by the "two-hour" rule in the CATI instructions: if respondents listed an activity that lasted more than two hours, the CATI program automatically brought the question onto the screen, "You've said that (activity) lasted quite a while. Is there anything else that you might have been doing during this time that we've overlooked?". Similarly, in order to include all work activities that may have involved travel, respondents who reported work at any time during the diary day were asked,

> While you were working, if you <u>went away</u> from your main place of work or main job site, either for job-related reasons, for personal business, or for lunch, breaks, or any personal errands, please report these activities separately. All of time you spent in any one location while at work can be reported as one activity.

All of these probes, then, served to ensure that respondents gave rather detailed accounts of their day's activities. In addition, interviewers were given special instruction to be sure that every change of location in the respondent's diary meant that there had to be some trip that preceded it. They were also alerted to separate trips to a dry cleaners

TABLE 2.2: CARB STUDY LOCATION CODES

A. Where in your house were you?

<1> Kitchen
<2> Living rm, family rm, den
<3> Dining Room
<4> Bathroom
<5> Bedroom
<6> Study/office
<7> Garage
<8> Basement
<9> Utility/Laundry rm
<10> Pool, Spa (outside)
<11> Yard, Patio, other outside house
<12> moving from room to room in the house
<x> Other (SPECIFY)

B. Where were you? (if not home)?

<21> Office building, bank, post office
<22> Industrial plant, factory
<23> Grocery store (convenience store to supermarket)
<24> Shopping mall or (non-grocery) store
<25> School
<26> Public bldg. (Library, museum, theater)
<27> Hospital, health care facility, or Dr.'s office
<28> Restaurant
<29> Bar, nightclub
<30> Church
<31> Indoor gym, sports or health club
<32> Other people's home
<33> Auto repair shop, indoor parking garage, gas station
<34> Park, playground, sports stadium (outdoor)
<35> Hotel, motel
<36> Dry cleaners
<37> Beauty parlor; barber shop; hairdressers
<38> At work: no specific main location; moving among locations
<39> Other indoors (SPECIFY)
<40> Other outdoors (SPECIFY)

C. How were you traveling? Were you in a car, walking, in a truck, or something else?

<51> Car
<52> Pick-up truck or van
<53> Walking
<54> Bus/train/ride stop
<55> Bus
<56> Train/rapid transit
<57> Other truck
<58> Airplane
<59> Bicycle
<60> Motorcycle, scooter
<61> Other (SPECIFY)

from other shopping and errands, to separate unloading groceries from meal preparation, to separate playing sports from watching sports, and to separate walking for exercise from walking to some destination. Of particular importance was the instruction to describe an activity for each episode rather than a simple location, for example, "praying" rather than "went to church" or "dancing (drinking)" rather than being "at a bar".

c. Diary Coding Procedures

In order to introduce the diary coding procedure, we refer the reader to Table 2.3, which gives a specimen time diary selected from the survey data file. Activities are shown in column 6 in the order in which they occurred as described verbatim by the respondent. The duration of each named activity in minutes is given in column 3 and may be calculated from the beginning and ending times in columns 1 and 2. The location code for each activity is given in column 4. Column 5 shows that a smoker was present only once during the entire 24 hour period. Finally, the activity codes assigned to each entry in column 6 are given in column 7.

The system for assigning activity codes to the verbatim responses in column 6 was adapted from that used in the 1965 Multinational Time Budget Research Project (as described in Szalai, et al, 1972). As such, it is relatively compatible with the coding systems used in the 1965, 1975, 1985, and 1987 national time-use surveys. In order to identify distinct activities of special interest to environmental researchers which would otherwise be grouped into larger aggregates, we sometimes modified the basic two-digit code by adding a third digit. For example, code 16 ("Household work - other repairs") was expanded by adding a

TABLE 2.3: SPECIMEN TIME DIARY

Time Began (1)	Time Ended (2)	Duration in minutes (3)	Location Code (4)	Others Smoking Present (5)	Activity (6)	Assigned Activity Code (7)
0:00 (12 midnight)	5:45 AM	345	5	No	Sleeping at night	45
5:45 AM	6:00 AM	15	5	No	Did stretching exercise	80
6:00 AM	6:05 AM	5	4	No	Went to bathroom, used toilet	40
6:05 AM	6:10 AM	5	11	No	Went out to backyard to get bike	89
6:10 AM	6:20 AM	10	59	No	Travelling; bicycling	82
6:20 AM	7:00 AM	40	31	No	Went to health club, exercising	80
7:00 AM	7:10 AM	10	59	No	Travelling; bicycling	82
7:10 AM	7:15 AM	5	11	No	Got home and put bike away	89
7:15 AM	7:35 AM	20	4	No	Took shower	40
7:35 AM	7:45 AM	10	5	No	Got dressed	47
7:45 AM	8:10 AM	25	1	No	Eating a meal or snack	43
8:10 AM	8:15 AM	5	53	No	Travelling, walking	9
8:15 AM	8:16 AM	1	54	Yes	Waited at bus stop	9
8:16 AM	8:35 AM	19	55	No	Travelling; in transit	9
8:35 AM	8:45 AM	10	53	No	Travelling; walking	9
8:45 PM	13:00 PM	255	21	No	Working (at main job)	1
13:00 PM	13:10 PM	10	53	No	Travelling; walking	3
13:10 PM	13:40 PM	30	24	No	Went shopping for birthday gifts	31
13:40 PM	13:50 PM	10	53	No	Travelling; walking	3
13:50 PM	14:10 PM	20	21	No	Went into office kitchen & ate lunch	6
14:10 PM	16:45 PM	155	21	No	Working (at main job)	1
16:45 PM	16:55 PM	10	53	No	Travelling; walking	9
16:55 PM	17:00 PM	5	54	No	Waited for bus	9
17:00 PM	17:35 PM	35	55	No	Travelling; in transit	9
17:35 PM	17:40 PM	5	53	No	Travelling; walking	9
17:40 PM	20:00 PM	140	5	No	Talked on phone	96
20:00 PM	20:10 PM	10	53	No	Travelling; walking	49
20:10 PM	22:00 PM	110	20	No	Eating a meal or snack	44
22:00 PM	22:10 PM	10	53	No	Travelling; walking	49
22:10 PM	22:20 PM	10	5	No	Changed clothes	47
22:20 PM	24:00 PM	100	5	No	Sleeping at night	45

Total in minutes = 1440

third digit - e.g., code 167 for "painting a room". The full set of two-digit activity codes used for the California Activity Pattern Survey, together with the additional three-digit codes, is listed in Appendix A).

Each activity was also coded according to the location where it occurred. For the most part, the 44 location codes were entered directly into the computer by interviewers at the time of the interview, using the location codes given in Table 2.2. To our knowledge, the California Activity Pattern Survey is the first to include location as a major component of the daily diary of activities. Thus estimates of time spent in various locations can be made for individuals and, in addition, one can obtain sample estimates of the full distribution of time in various locations for the population and for various subgroups. Furthermore, by cross-classifying type of activity by location, measures of time use for specific combinations of activity and location can be generated for each respondent. Thus, for example, it is possible to compute time spent painting indoors, picnicking in a park, etc.

After each diary was recorded, and edited to be sure it added to 1440 minutes and it contained a properly integrated set of activities, it was transferred to a file of diaries that were ready for coding. All activity coding was done by the senior investigator on the project (Dr. Robinson), who was familiar both with the original Szalai *et al* code and with the adaptations and special activity distinctions of interest to ARB. To ensure consistency of coding across time, they were coded in large batches (of 100-400 at a time).

The text of each diary entry was first listed in chronological order across the day. The activity coding scheme in Table 2.4 and

Appendix A was applied to each activity based on the most appropriate two-digit code (or three-digit code for some more complex activities) to each activity on the print listing; that listing already contained the time began-ended, location and smoker-present information attached to the text activity description. Once all such diaries for one of the four seasonal data waves was complete, they were then sent to the University of Maryland for data coding. The diary codes were then added to the diary data files.

When all the activity codes for a seasonal wave had been entered, a new activity listing was printed, this time already sorted by activity. Thus the first set of entries on this listing was all the 01 codes for paid work (main job). The original coder then looked through all the sorted text activity listings under category 01 to be sure they were paid work activities. He then proceeded in the same manner through the code 02 text entries, the code 03 entries, etc. through the complete listing of all ordered activities. What made this task of activity editing easier than the original activity coding was that the coder only had to verify that the text activity was in the correct category rather than assign it to one of the original categories. One of the factors that aided this process was that the activity listings were also sorted by the location of the activity to ensure that the coded activity was consistent with the place in which it occurred.

The coder then noted all code discrepancies on the print listing and those were returned to data entry personnel for recoding. This procedure was repeated twice more in successively larger listings to ensure that the coding was consistent across waves. The last listing contained all the diaries at one time and thus provided a completely

TABLE 2.4: TWO- AND THREE-DIGIT ACTIVITY CODES FOR ARB STUDY

00-09 PAID WORK
- 00 (not used)
- 01 Main job
- 02 Unemployment
- 03 Travel during work
- 04 (not used)
- 05 Second job
- 06 Eating
- 07 Before/after work
- 08 Breaks
- 09 Travel to/from work

10-19 HOUSEHOLD WORK
- 10 Food preparation
- 11 Meal cleanup
- 12 Cleaning house
- 124 Cleaning and laundry together
- 13 Outdoor cleaning
- 14 Clothes care
- 149 At Laundromat
- 15 Car repair/maintenance (by R)
- 16 Other repairs (by R)
- 165 Darkroom photographic work
- 166 Repairing boat
- 167 Painting a room or house
- 169 Building a fire
- 17 Plant care
- 18 Animal care
- 19 Other household

20-29 CHILD CARE
- 20 Baby care
- 21 Child care
- 22 Helping/teaching
- 23 Talking/reading
- 24 Indoor playing
- 25 Outdoor playing
- 26 Medical care - child
- 27 Other child care
- 28 At Dry cleaners
- 29 Travel, child care

30-39 OBTAINING GOODS AND SERVICES
- 30 Everyday shopping
- 31 Durable/house shop
- 32 Personal services
- 33 Medical appointments
- 34 Govt/financial service
- 35 Car repair services
- 36 Other repair services
- 37 Other services
- 38 Errands
- 39 Travel, goods and services

40-49 PERSONAL NEEDS AND CARE
- 40 Washing, etc.
- 41 Medical care
- 42 Help and care
- 43 Meals at home
- 44 Meals out
- 45 Night sleep
- 46 Naps/day sleep
- 47 Dressing, etc.
- 474 Washing and dressing
- 48 N.A. activities
- 49 Travel, personal care

50-59 EDUCATION AND TRAINING
- 50 Students' classes
- 51 Other classes
- 52 (not used)
- 53 (not used)
- 54 Homework
- 55 Library
- 56 Other education
- 57 (not used)
- 58 (not used)
- 59 Travel, education

60-69 ORGANIZATIONAL ACTIVITIES
- 60 Professional/union
- 61 Special interest
- 62 Political/civic
- 63 Volunteer/helping
- 64 Religious groups
- 65 Religious practice
- 66 Fraternal
- 67 Child/youth/family
- 68 Other organizations
- 69 Travel, organizations

70-79 ENTERTAINMENT/SOCIAL ACTIVITIES
- 70 Sports events
- 71 Entertainment, events
- 72 Movies
- 73 Theatre
- 74 Museums
- 75 Visiting
- 76 Parties
- 77 Bars/lounges
- 78 Other social
- 79 Travel, events/social

80-89 RECREATION
- 80 Active sports
- 801 Golf
- 802 Bowling
- 803 Yoga
- 81 Outdoor
- 82 Walking/biking
- 83 Hobbies
- 84 Domestic crafts
- 85 Art
- 86 Music/drama/dance
- 87 Games
- 88 Computer use
- 89 Travel, recreation

90-99 COMMUNICATION
- 90 Radio
- 91 TV
- 914 TV and eating
- 92 Records/tapes
- 93 Read books
- 939 TV and reading
- 94 Reading magazines/other
- 95 Reading newspaper
- 954 Reading and eating
- 96 Conversations
- 97 Writing/household paperwork
- 98 Think, relax
- 99 Travel, communication

comprehensive check that the coding of activities was consistent across the entire project. This last listing required checking the text of more than 37,000 individual diary entries of activities.

For the purpose of this report, we created a collapsed coding scheme for activities which consists of 26 mutually exclusive activity codes. The reduction from more than one hundred to 26 codes facilitates data presentation without undue aggregation of the activity data. Table 2.5 shows the composition of the 26 activity codes in terms of the original two and three digit activity codes. And in Figure 2.3 we apply the reduced coding scheme to the specimen diary in Table 2.3.

6. Response Rates and Sample Representativeness

As noted in Section 2 above, the target population for the California Activity Pattern Survey (CAPS) consisted of Californians living in households containing at least one telephone. To avoid the additional costs of translating the questionnaire into other languages and hiring bilingual interviewers, we also excluded households with no English-speaking adults. The exclusion of households with no telephones or with no English-speaking adults undoubtedly introduces some bias into the population estimates based on the CAPS sample. Because most California households contain phones (the proportion of households with phones is estimated at 92-96% in California metropolitan areas by Survey Sampling, Inc., 1989), the bias in overall estimates due to exclusion of no-phone households is unlikely to be severe. Nonetheless, it is known that households without phones are also more likely to be composed of individuals from lower socioeconomic strata (Groves, 1989). Therefore any activities or locations directly correlated with socioeconomic status are likely to be underrepresented in the sample data. For

TABLE 2.5: COLLAPSED ACTIVITY CODES USED IN THIS REPORT

	Activity	Codes
1.	Eating	06, 43, 44, 914, 954
2.	Sleeping/Resting	45, 46
3.	Working (Paid) (Total and breakdown by occupation)	01, 07, 05
4.	Cooking/Meal Prep. & Cleanup	10, 11
5.	Household Cleaning & Chores, Clothes Care	12, 19, 14, 124, 149
6.	Yard Work, Gardening, Outdoor Chores, Doing General House Repairs	13, 17, 16, 105, 166, 167, 169
7.	Dry Cleaners	28
8.	Travelling/in Transit (total & breakdown by mode)	03, 09, 29, 39, 49 59, 69, 79, 89, 99
9.	Doing Car Repair/Maintenance, Car Services	15, 35
10.	Animal Care	18
11.	Baby/Child Care/Care of Other Adults	20, 21, 22, 23, 24, 26, 27, 42
12.	Food Shopping/Other Shopping	30, 31
13.	Personal Care Services (Beauty/Barber Shop)	32
14.	Obtaining Services, Running Errands	33, 34, 36, 37, 38
15.	Personal Care (self)	40, 41, 47, 48, 474
16.	Attending Classes/Education Activities Organizational Meetings/Activities	50, 51, 54, 55, 56, 60, 61, 62, 63, 64, 65, 66, 67, 68
	Participating in Active Sports, Exercising	80, 82 (not including 801, 802, or 803)
	Participating in Less Active Sports, Outdoor Leisure Activities	25, 801, 802, 803, 81
19.	Hobbies & Crafts	83, 84, 85
20.	Singing, Dancing, Playing instruments	86
21.	Attending Sports Events, Attending Cultural Events (museums, movies)	70, 71, 72, 73, 74
22.	Socializing, Parties, Games Conversation	75, 76, 78, 87, 96
23.	Visiting Bars & Lounges	77
24.	Computer Use, Radio, TV, Records	88, 90, 91, 92 (not including 914)
25.	Reading, Writing, Household Paperwork	93, 94, 95, 97, 98, 937 (not including 954)
26.	Other	02, 08

FIGURE 2.3: COLLAPSED ACTIVITY CODES FOR SPECIMEN DIARY IN TABLE 2.3

Collapsed Code	Activity	Duration in Minutes
1	Eating (6, 43, 44)	155
2	Sleeping (45)	445
3	Work (1)	410
6	Outdoor work (13)	5
8	Travel (3, 9, 49, 89)	135
12	Shopping (31)	30
15	Personal Care (40, 47)	45
17	Active Sports/Exercise (80, 82)	75
22	Socializing, Parties, Conversation (96)	140
	Total	1440

example, recent surveys of smoking behavior suggest that prevalence of smoking is generally higher in households without a phone than in those with at least one phone (Gentry and Kalsbeek, 1989). Thus, for activity and location patterns strongly correlated with socioeconomic status, caution should be used extending our sample estimates to the general population.

The overall field outcomes for the sampled telephone numbers are given in Table 2.6. A total of 4969 telephone numbers was set up for interviewing. Of that number, 2368 were not eligible households. Interviews were attempted with the remaining 2601 households. Of these 2601, interviews were completed with a randomly selected adult in 1579 households, yielding a response rate of 60.7 percent. The proportion of refusals was somewhat larger than we usually encounter in general population telephone samples, due perhaps to the relatively demanding nature of this interview.

The results for youth are given in Table 2.7. We enumerated 256 children between the ages of 12 and 17. Of that number, we completed interviews with 183, or 71.5 percent. The largest source of non-response for youth was informant refusals. In such cases the adult with whom the interviewer was speaking (usually the parent) refused to allow the selected young person to be interviewed. Note that we did not attempt to select and interview a young person unless the adult interview had been successfully completed. Statistics for youth, consequently, will be based on those households in which both an adult and a young person completed the interview.

All in all, 1762 interviews (with daily diary) were completed, 1579 with randomly selected adults and 183 with randomly selected

TABLE 2.6: OUTCOME FOR HOUSEHOLDS AND ADULTS SAMPLED

	Number	% of Total	% of Eligible
Total Selections	4969	100.0	
Ineligible for the Sample			
Not in service	1303	26.2	
Not a residence	847	17.0	
Never answered*	57	1.1	
Not English-speaking	161	3.2	
Total ineligible	2368	47.7	
Eligible Sample Units	2601	52.3	100.0
Non-response			
Informant refused	535	10.8	20.6
Respondent refused	232	4.7	8.9
Respondent never home	178	3.6	6.8
Respondent cannot participate	60	1.2	2.3
Incomplete diary	17	0.3	0.7
Total non-response	1022	20.6	39.3
Completed adult interviews	1579	31.8	60.7

*Never answered after at least 35 calls.
Most are disconnected business numbers.
A small proportion could be residential.

adolescents within the adult households. The composition of this sample by season of interview is given in Table 2.8.

The overall representativeness of the CAPS sample is a function of several interrelated factors. First, there is the aforementioned possibility of bias due to exclusion of non-English speaking respondents and of households without telephones. Second, the population estimates constructed from the sample may be biased if participation (i.e., agreeing to be interviewed versus refusal) is correlated with the characteristics being estimated. For example, if persons who spend a great deal of their time outdoors were less likely to complete an interview than those spending most of their time indoors, the sample estimate of mean time outdoors will tend to underestimate the true population figure. Third, the overall effect of bias of the second kind depends on the magnitude of the response rate. Other things being equal, the higher the response rate, the better the estimate. Finally, we note that if participation is non-selective with respect to the characteristic being estimated, the effect of non-response is simply to reduce the size of the sample and therefore to increase the standard error of estimate relative to that obtained with 100% participation; there is no further effect on the representativeness of the estimates.

The combined response rate for adults and adolescents, 61.7%, falls at the low end of the normal range of response rates for telephone interview studies using random-digit-dialing. Even to attain this level of participation, we had to expend considerable effort to convert initial refusals to completed interviews. [About 16% of the completed adult interviews were the result of contacts subsequent to an initial refusal to be interviewed.] Unfortunately, the extent to which

TABLE 2.7: OUTCOME FOR ENUMERATED YOUTH RESPONDENTS

	Number	% of Enumerated
Total Enumerated Youth	256	100.0
Non-response		
Informant refused	45	17.6
Respondent refused	5	2.0
Respondent never home	19	7.4
Respondent cannot participate	3	1.2
Incomplete diary	1	0.4
Total non-response	73	28.5
Completed Youth Interviews	183	71.5

TABLE 2.8: DISTRIBUTION OF THE SAMPLE BY AGE AND SEASON OF INTERVIEW

Season of Interview	Adults 18 yrs+	Adolescents 12-17 years	Total
Oct.Dec. 1987	440	48	488
Jan.-Mar. 1988	418	55	473
Apr.-June 1988	265	25	290
July-Sept. 1988	456	55	511
Total	1579	183	1762

participants and non-participants differ with respect to population characteristics of interest cannot be determined from the sample data alone. However, as a partial check on the representativeness of the sample, it is possible to compare certain sample estimates with independent estimates from the Current Population Survey of 1987.

Table 2.9 shows the distribution of the California population aged 18 and over in 1987, based on the Current Population Survey, compared to a distribution estimated from the California Activity Pattern Survey of 1987-88. Estimates from CAPS were constructed using the sampling weight the Adult Household Sampling Weight ("sampwt"), as described in Appendix D. We note that while the population size estimates from CAPS are within 10% of the corresponding CPS estimates for age groups 18-34 and 35-64, the estimated numbers of persons 65 and over are considerably below the CPS figures, especially for the male population. This difference may be the result of a) lower prevalence of telephones among the over 65 population as compared with younger groups, b) a relatively lower survey response rate among persons over 65, or c) both a) and b). For making refined population estimates for characteristics that are known to be sensitive to age variations, users of the CAPS data should consider weighting the cases with the ratios given in column 3 of Table 2.9, in addition to using the normal sampling weights. In most cases, however, use of the additional weight will have little effect on the final estimates.

7. Statistical Procedures

Because the distributions of minutes spent in various locations and activities are often highly skewed, we have made limited use of

statistical tests in this report. However, such tests were used to aid in the interpretation of some of the data tables. The tests used are described below.

a. Tests of the significance of differences in mean time spent in a location or activity are used for Tables 3.4,3.5, and 4.1. The null hypothesis tested in each case is the global null hypothesis that there are no differences between the population means corresponding to the subgroups specified in the table (e.g., no differences regional differences in Table 3.4). The tests are performed by conducting a one-way analysis of variance of weighted data in which the F-ratio for group differences is the criterion statistic (SPSS, Inc.,1983, pp. 453ff). Although the frequency distributions of the data are skewed, the sampling distributions of the means should be approximately normal given the sample sizes in the tables (the minimum sample size for subgroups in Tables 3.4,3.5, and 4.1 is N=290). Thus, the F-ratio tests should be appropriate for these tables (see, for example, Dixon and Massey, 1969, pp. 150ff).

b. Tests of significance of differences in the proportions of persons who used or were near various potential pollution sources are given in Tables 3.12, 3.13, 3.14, and 3.15. The null hypotheses tested are that the population proportions are the same for the subgroups (or subsets of subgroups) specified in the tables. The test is performed by conducting a linear logit analysis of weighted data using the SPSS Loglinear subroutine (SPSS, Inc.,1983, pp. 541ff). Significance is tested by partition of a Chi-squared statistic which permits tests of main effects

and interactions effects in multifactor tables (e.g., Tables 3.12 and 3.13) and main effects in single factor tables (e.g., Tables 3.14 and 3.15). The assumptions required for these tests, namely random sampling and categorical data, are satisfied by the weighed data used in these tables (see Bishop, et al., 1975).

CHAPTER III. GENERAL RESULTS

In this chapter, we present basic analyses of the data set. It needs to be stressed at the outset that estimates of any variable in survey research may be inflated (or deflated) depending on how the question is worded or how measurement criteria are operationally defined. In terms of relations between variables, it will be noted that these are put forth as bivariate (cross-tabulated) associations or relations and that far more complicated and multivariate analyses need to be performed before conclusions about possible cause-effect or deterministic influences can be reached. It is also the case that many cells in these analyses contain too few cases to warrant much generalization.

Nonetheless, such exploratory analyses are necessary to initiate the scientific analysis process prior to any conclusions or recommendations that may be of concern. We have conducted some initial calculations/estimations and have highlighted findings that appear to be of relevance to environmental researchers. Further questions can be easily addressed using the data which will be made publicly available for that purpose. The number of hypotheses that can be tested or of projections that can be made from the data set now seems virtually limitless. We trust our presentation of the data will highlight some major themes and patterns occurring in the data and that many of these will be appropriately addressed in future multivariate causal analyses.

Calculations in the tables in this chapter are mainly given in average minutes per day (sometimes translated into hours per week or per day when that seems appropriate or helpful) for the entire sample. The data have been weighted by day of the week and by season of the year so

they can be simply multiplied by 7 (days of the week) and divided by 60 (minutes per hour) to provide appropriate equivalents in hours per week. They have also been weighted by region and by household size (as noted in Appendix D) to permit generalizability across the (English-speaking, telephone-owning) state population.

In many cases the overall mean may not be the most meaningful statistical parameter for a specific activity or location, because many respondents report zero (0) minutes in such an activity or location for the diary day -- as in the case of going to a dry cleaners or a beauty parlor. The overall average of 2 minutes per day at beauty parlors/barber shops has limited meaning for individuals who do not go to such places. Therefore for the general introductory tables, we present data in terms of average time (minutes per day) per person engaging in an activity, which are labelled "mean/doer" in the tables. We refer to these statistics as average times per participant. It is not possible within the limited scope and resources of the present report to show these data, or alternative parameters like percent participating or median values, for all the various cross-tabs shown in the later analyses in this chapter. Data for these parameters, or for specific hypotheses, can easily be tabulated from the data computer files that are provided from the project.

The four sections which follow present basic summary data pertaining to 1) locations, 2) activities, 3) use of, or proximity to, potential pollution sources, and 4) presence of others smoking during the diary episodes. Each section is divided into two parts. We first highlight the findings under each heading, with a focus on findings which are of concern to environmental researchers. We then give a more

complete summary of the results presented in the accompanying tables. Summary statistics are given a) for subgroups classified by gender, employment status, age, and region, and b) by season of interview.

1. Time spent in various locations.

Summarizing some of the main results:

* Of the total time across the week, 87% (1253 minutes per day) was spent in indoor locations, 5% in outdoor locations [At home, in pool/spa (code 10) or yard (code 11), at playground or park (code 34), or at other outdoor locations (code 40)] and 8% in travel. Of the time spent indoors, more than two-thirds (893 minutes per day) was inside the respondent's home, with the bedroom (524 minutes) and living room (196 minutes) being the main rooms of the house where time was spent. Of the time spent indoors away from home, about one-third of time was spent at places of work and other people's homes.

* The mean time spent in outdoor locations across the sample across the year was 73 minutes per day, which translates to about 1.2 hours per day or just over 8.5 hours per week.

* The average time spent for those in the sample who spent time in some outdoor location was 157 minutes per day. The major outdoor locations were "other outdoor" and in the yard of one's home, which totaled 33 and 27 minutes per day, respectively, or about two-thirds of all time spent outdoors.

* The mean time spent in travel was 111 minutes per day. Some 92% of the sample took at least one trip on the diary day and the mean time for those who did travel was 127 minutes per day. About two-thirds of travel time was spent in automobiles (73 minutes per day, 99 minutes per

day per participant) and another 16% of travel time was spent in vans or small trucks.

We turn now to a presentation of the more detailed results. Table 3.1 presents the major features of the data on respondent location. It can first be seen by glancing down the first column that the major room in the house as far as daily time is concerned is, not surprisingly, the place where the most time-consuming activity (sleeping) takes place, namely the bedroom (524 minutes). About 328 minutes (five and a half hours) more time is spent there each day than in the next most time-intensive place, the living room (196 minutes). And almost three times as much time is spent in the living room as in the kitchen, the third most frequently used room in the house (74 minutes). On average, less than half an hour per day on average is spent in the next set of at-home locations -- bathrooms, yards, dining rooms, and "other" rooms. Garages, basements, utility rooms, and pool/spa areas take up less than 10 minutes per day when aggregated across the entire sample.

These ratios are also generally reflected in the times spent in each of these rooms <u>on a per participant basis</u> (Column 3). However, some rooms may have low overall amounts of time spent in them for the entire sample but also have relatively high times spent for those who have such rooms and do spend time there, as shown in Column 3. For example, those relatively few respondents who spend time in studies and garages do spend more than an hour in these locations; that is also reflected in the high maximum lengths of times (Column 5) in these locations. It may also be seen as a function of the small percentages of people who spent time there (Column 4).

Table 3.1: MINUTES OF TIME SPENT IN DIFFERENT LOCATIONS

Number of Valid Observations (Listwise) = 1762.00

Variable	1. Estimated Population Mean	2. Std Dev	3. Does** Mean	4.% Reporting Location	Maximum	N	Label
WC01	73.9	96.6	98	75%	930	1762	In Kitchen
WC02	196.3	205.0	246	80%	1340	1762	In Living Room
WC03	21.1	53.7	73	29%	880	1762	In Dining Room
WC04	32.9	53.4	45	74%	650	1762	In Bathroom
WC05	524.1	210.5	546	96%	1435	1762	In Bedroom
WC06	7.3	51.6	145	5%	1256	1762	In Study
WC07	9.1	55.7	97	9%	845	1762	In Garage
WC08	.4	7.3	79	1%	180	1762	In Basement
WC09	2.6	16.5	53	5%	380	1762	In Utility Room
WC10	.7	8.6	69	1%	230	1762	Pool, Spa
WC11	27.1	74.6	99	27%	840	1762	In Yard
WC12	21.8	60.1	89	24%	750	1762	Room To Room
WC13	3.7	32.1	60	6%	1015	1762	Other HH Room
WC01-13	921.1	307.2	934	99%	1440	1762	Total At Home
WC21	70.1	163.6	275	25%	725	1762	At Office
WC22	34.9	128.1	393	9%	750	1762	At Plant
WC23	12.4	52.4	56	22%	689	1762	At Grocery Store
WC24	33.8	97.7	124	27%	845	1762	At Shopping Mall
WC25	40.4	115.6	261	15%	724	1762	At School
WC26	13.2	65.7	175	8%	750	1762	Other Public Place
WC27	14.4	75.7	181	8%	840	1762	At Hospital
WC28	28.1	70.3	81	35%	885	1762	At Restaurant
WC29	8.0	49.5	174	5%	825	1762	At Bar-Nightclub
WC30	6.3	34.0	135	5%	395	1762	At Church
WC31	4.2	24.4	98	4%	395	1762	At Indoor Gym
WC32	60.6	155.2	200	30%	1440	1762	At Other's Home
WC33	10.5	63.7	91	12%	685	1762	At Auto Repair/Gas
WC34	12.3	57.1	149	8%	595	1762	At Playground/Park
WC35	6.7	58.5	308	2%	985	1762	At Hotel-Motel
WC36	.4	15.0	62	1%	580	1762	At Dry Cleaners
WC37	2.0	23.1	111	2%	510	1762	At Beauty Parlor
WC38	1.9	25.2	159	1%	630	1762	At Varying Locations
WC39	11.7	66.1	138	9%	945	1762	Other Indoor
WC40	33.2	103.0	146	23%	915	1762	Other Outdoor
WC21-40	405.0	272.4	441	92%	1440	1762	Total Away
WC51	73.3	83.1	99	74%	585	1762	In Car
WC52	17.9	55.4	102	17%	785	1762	In Van
WC53	9.9	26.8	38	26%	360	1762	Walking
WC54	.9	7.3	37	2%	187	1762	At Ride Stop
WC55	3.8	52.0	114	3%	1320	1762	On Bus
WC56	1.1	19.4	123	1%	395	1762	On Rapid Train
WC57	1.1	16.1	85	1%	548	1762	Other Truck
WC58	.6	11.3	130	*	315	1762	On Airplane
WC59	1.3	8.9	41	3%	190	1762	On Bicycle
WC60	1.2	13.9	62	2%	430	1762	On Motorcycle
WC61	.5	8.0	38	1%	270	1762	Other Transportation
WC51-61	111.4	107.9	122	92%	1320	1762	Total In Travel
WC99	2.5	24.4	133	2%	550		Unknown location
	73	138	157	46%	920	1762	Outdoors
	1253	178	1251	100%	1440	1762	Indoors
	111	108	122	92%	1320	1762	In-transit

* Less than 0.5%

** "Does" refers to those who reported being in a given location.

As shown in Table 3.1, the total average amount of time spent at home for the entire sample is 921 minutes or about 15 hours per day. Since almost all respondents (99%) spent at least some time at home, the overall average amount of time at home for those at home during the day is very close (at 934 minutes per day) to the mean for the entire sample. The 1440 minutes figure in the maximum column indicates that some respondents actually spent the entire day at home.

The comparative figures for away-from-home locations show a similar range, before and after adjustment for the participation rate. Those persons who went to offices or industrial plants average more than four hours per day in these locations. Respondents who go to indoor gyms or auto repair shops, on the other hand, spent less than two hours per day there. In all, some 92% of the sample spent at least some time in one of these away-from-home locations, and the average time per participant was 441 minutes, or about 7 hours per day away from home.

There was a population mean of 111 minutes of travel time. It was, of course, dominated by the automobile (73 minutes), and the three-quarters of the sample who took an automobile trip spent 99 minutes (about 1.7 hours) driving by car; similar trip times (102 minutes per participant) were reported by users of vans and small trucks. Some 26% of the sample reported walking on the diary day as a transit mode and their average time was more than half an hour (this generally excluded time spent walking within buildings); walking here includes walking for pleasure, which is coded as a separate activity in the activity codes (Tables 3.6 to 3.10). Some 92% of the sample took at least one trip on the diariy day and the average time per participant was 127 minutes (2

hours); one respondent travelled for 1320 minutes on the day, or almost the entire day.

Employment: Variations in time spent in these locations for employed and unemployed men and women are shown in Table 3.2. It can first be seen in the middle of the table that employed men and women both spent about 200 minutes per day less time at home than non-employed men and women. Women, both employed and non-employed, spent about an hour more time at home than do employed and non-employed men, respectively.

These differences are reflected as well for time spent in most rooms in the house. Women in general also spent proportionately more time in the kitchen, in the bathroom, and moving from room-to-room in the house. Men spent more time in the garage and in the yard.

Employed men and women spent more time than non-employed men and women in the bathroom. Proportionately, the non-employed spent more than 20% more time than the employed in such at-home locations as the kitchen, living room, dining room, yard and "other" rooms.

With regard to overall time spent away from home, the employed spend about three-fourths more time away from home as the non-employed. On a weekly basis, the figures translate to about 61 hours in away-from home locations (excluding travel) for employed men, 52 hours for employed women, 33 hours for non-employed men and 28 hours for non-employed women.

Most of this difference is, of course, for time spent at work locations, with offices, shopping malls, and hospitals being higher for employed women and plants and restaurants higher for employed men. Employed people also spent more time at shopping malls, at restaurants,

MEAN TIME SPENT IN VARIOUS LOCATIONS BY GENDER AND EMPLOYMENT STATUS

(in minutes per day; includes non-participants)

	MEN			WOMEN		
Location	Not Employed	Employed	TOTAL	Not Employed	Employed	TOTAL
n =	(249)	(573)	(822)	(430)	(510)	(940)
AT HOME						
1. Kitchen	65	41	48	128	75	99
2. Living Room	279	153	188	253	164	204
3. Dining Room	23	17	19	33	16	24
4. Bathroom	18	32	27	33	43	39
5. Bedroom	554	484	504	577	518	544
6. Study	6	7	7	9	6	8
7. Garage	30	7	13	5	5	5
8. Basement	1	*	*	1	*	1
9. Utility Room	1	2	1	6	2	4
10. Pool, spa	1	1	1	1	*	1
11. Yard	50	27	33	27	16	21
12. Room to Room	12	8	10	40	29	34
13. Other HH Room	5	2	3	6	3	4
TOTAL AT HOME	1044	780	854	1119	879	986
AWAY						
21. Office	4	87	64	7	131	76
22. Plant	2	84	61	1	17	9
23. Grocery Store	5	13	11	11	18	14
24. Shopping Mall	14	33	27	32	47	40
25. School	80	27	42	52	29	39
26. Other Public Place	3	21	16	10	11	10
27. Hospital	5	10	9	7	31	20
28. Restaurant	22	37	33	16	30	24
29. Bar-Nightclub	5	15	12	*	7	4
30. Church	7	6	7	8	4	6
31. Indoor Gym	6	4	4	3	5	4
32. Others Home	55	62	60	63	59	61
33. Auto Repair	11	21	18	2	4	3
34. Playground/park	14	18	17	4	10	8
35. Hotel-Motel	*	8	6	3	12	8
36. Dry Cleaners	*	*	*	*	1	1
37. Beauty Parlor	*	*	*	3	4	4
38. Moving around	*	4	3	*	2	1
39. Other Indoor	7	20	16	5	9	8
40. Other Outdoor	43	58	53	13	15	14
TOTAL AWAY	283	527	459	240	444	353

* Less than 0.5 minutes per day

Table 3.2 (Continued)

MEAN TIME SPENT IN VARIOUS LOCATIONS BY GENDER AND EMPLOYMENT STATUS

(in minutes per day; includes non-participants)

	MEN			WOMEN		
Location	Not Employed	Employed	TOTAL	Not Employed	Employed	TOTAL
n =	(249)	(573)	(822)	(430)	(510)	(940)
TRAVEL						
51.Car	56	79	73	57	88	74
52.Van	11	33	27	6	12	9
53.Walking	16	10	11	9	8	8
54.Bus Stop	1	*	1	*	1	1
55.Bus	16	2	6	2	2	2
56.Rapid Train	*	1	*	*	3	2
57.Other Truck	1	2	2	1	1	1
58.Airplane	*	1	1	*	*	*
59.Bicycle	4	1	2	*	*	*
60.Motorcycle	4	2	2	*	*	*
61.Other Transportation	*	1	1	1	*	*
TOTAL TRAVEL	109	132	125	77	115	98
99.Unknown location	4	1	2	4	3	3
GRAND TOTAL	1440	1440	1440	1440	1440	1440
TOTAL OUTDOORS	107	104	105	45	41	43
TOTAL INDOORS	1220	1204	1208	1315	1281	1296
TIME IN TRANSIT	109	132	125	77	115	98

* Less than 0.5 minutes per day

at auto repair facilities, at hotels/motels and at "other" indoor locations. Non-employed men and women spent more time at schools (because students are included here).

In addition to spending more time in offices and hospitals, women spent more time than men in grocery stores, shopping malls, and beauty shops/barbers. Men spent more time than women in restaurants, bars/nightclubs, auto repair facilities, playgrounds/parks, and "other" indoor and outdoor locations.

With regard to travel time, men spent more time on the average traveling (125 minutes per day or almost 15 hours per week) than women (98 minutes per day or about 11 hours per week). Men traveled more than women, and the employed traveled more than the non-employed. Non-employed men traveled less than the employed in all modes except walking and bus. More than two-thirds of all travel was done by automobile or van, with automobile travel being about six times higher than van travel. Automobile and van travel were in turn almost ten times higher than time spent walking for transit purposes.

The bottom row of data in Table 3.2 is for times spent outdoors (Codes 10, 11, 34, and 40 - see Table 3.1 for definitions). This averaged about almost two hours per day (105 minutes) for men and about less than one hour (43 minutes) for women.

Age: Average time spent in various locations for men and women of various ages are shown in Table 3.3. In general it can be seen that time at home is curvilinearly related to age, with time declining for men from 893 minutes (15 hours) per day for 12-17 year olds and 18-24 year olds to about 800 minutes (13 hours) per day for those aged 25-54; it then increases to 958 minutes (16 hours) for men aged 55-64 and

Table 3.3

MEAN TIME SPENT IN VARIOUS LOCATIONS BY AGE AND GENDER

(in minutes per day; includes non-participants)

	MEN							WOMEN						
Age	12-17	18-24	25-34	35-44	45-54	55-64	65+	12-17	18-24	25-34	35-44	45-54	55-64	65+
n =	(98)	(96)	(183)	(172)	(106)	(82)	(77)	(85)	(96)	(223)	(179)	(110)	(112)	(125)
AT HOME														
1. Kitchen	27	35	35	43	55	81	104	42	51	101	107	101	134	154
2. Living Room	136	167	171	175	174	234	330	188	207	176	182	199	256	270
3. Dining Room	15	11	13	16	26	30	34	8	18	17	25	29	27	49
4. Bathroom	26	26	31	29	23	23	24	44	37	50	33	30	28	40
5. Bedroom	651	502	481	479	461	483	549	611	520	552	506	532	557	550
6. Study	*	3	4	11	12	12	10	*	*	4	7	7	14	27
7. Garage	3	3	27	10	8	15	9	1	6	5	5	14	5	2
8. Basement	*	*	*	*	*	*	2	*	*	1	*	*	*	3
9. Utility Room	*	2	1	1	3	*	7	1	1	3	3	4	6	8
10. Pool, spa	1	2	1	*	*	1	2	1	*	1	*	*	*	*
11. Yard	27	20	28	29	32	67	54	11	7	13	33	27	35	26
12. Room to Room	4	10	5	12	16	6	18	11	15	35	37	38	47	51
13. Other HH Room	1	1	1	3	1	7	9	*	1	3	5	5	6	11
TOTAL AT HOME	893	782	798	809	812	958	1152	917	862	960	942	987	1114	1191
AWAY														
21. Office	*	37	92	104	87	49	15	3	86	104	124	86	40	5
22. Plant	6	67	84	72	60	71	22	*	12	8	19	16	7	*
23. Grocery Store	5	13	9	8	25	4	8	4	15	16	11	17	14	21
24. Shopping Mall	20	48	22	25	49	8	8	66	74	43	22	34	24	18
25. School	178	49	15	18	30	23	17	175	78	10	17	32	21	1
26. Other Public Place	8	7	24	14	39	6	4	1	7	10	12	15	8	19
27. Hospital	1	13	10	10	3	11	7	2	8	44	21	12	13	10
28. Restaurant	20	35	32	48	26	31	20	11	16	29	33	33	24	28
29. Bar-Nightclub	*	19	29	6	7	1	*	*	9	6	6	2	*	*
30. Church	7	3	3	13	11	3	5	9	1	6	6	8	6	9
31. Indoor Gym	11	3	6	4	2	*	5	10	3	6	4	1	*	*
32. Others Home	79	98	48	75	37	43	31	106	79	55	67	64	40	26
33. Auto Repair	25	13	29	9	17	15	11	1	9	2	3	5	*	1
34. Playground/park	30	14	33	10	3	6	13	4	15	10	5	4	6	4
35. Hotel-Motel	*	14	7	9	2	*	*	3	14	12	6	5	1	7
36. Dry Cleaners	*	*	*	*	*	*	*	*	*	*	4	*	*	*
37. Beauty Parlor	*	*	*	*	*	1	1	*	4	*	9	3	8	5
38. Moving	*	1	2	5	8	1	*	*	*	2	3	*	*	*
39. Other Indoor	14	6	30	7	27	11	3	3	9	4	8	5	13	14
40. Other Outdoor	20	71	48	67	44	80	33	26	19	11	19	6	12	6
TOTAL AWAY	427	504	523	503	476	363	202	425	457	378	386	350	239	175

* Less than 0.5 minutes per day

Table 3.3 (Continued)

MEAN TIME SPENT IN VARIOUS LOCATIONS BY AGE AND GENDER

(in minutes per day; includes non-participants)

	MEN							WOMEN						
Age	12-17	18-24	25-34	35-44	45-54	55-64	65+	12-17	18-24	25-34	35-44	45-54	55-64	65+
n =	(98)	(96)	(183)	(172)	(106)	(82)	(77)	(85)	(96)	(223)	(179)	(110)	(112)	(125)
TRAVEL														
51.Car	57	83	72	76	82	70	55	72	89	80	78	69	61	59
52.Van	12	34	29	31	23	34	12	4	7	10	13	16	10	1
53.Walking	21	19	4	11	11	9	12	12	12	7	8	6	6	9
54.Bus Stop	4	*	*	*	*	*	*	1	2	1	*	*	*	*
55.Bus	7	4	2	*	31	*	*	6	5	*	1	2	*	1
56.Rapid Train	*	*	1	*	*	*	*	*	1	*	9	*	*	*
57.Other Truck	1	4	*	3	3	*	2	*	*	2	*	*	*	*
58.Airplane	*	*	3	1	*	1	*	*	1	*	*	*	*	1
59.Bicycle	8	2	1	2	2	*	*	1	2	*	*	*	*	*
60.Motorcycle	7	1	4	2	*	1	*	*	*	*	*	*	*	*
61.Other	1	*	*	2	*	*	1	*	*	*	*	*	2	*
TOTAL TRAVEL	118	147	118	129	152	115	81	96	119	101	109	92	80	71
99.Unknown location	3	2	1	*	*	3	5	2	1	1	2	12	6	3
GRAND TOTAL	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
TOTAL OUTDOORS	78	106	110	107	79	154	102	42	41	35	56	38	53	36
TOTAL INDOORS	1242	1185	1212	1204	1209	1168	1251	1300	1278	1303	1272	1293	1300	1329
IN-TRANSIT	118	147	118	129	152	115	81	96	119	101	109	92	80	71

* Less than 0.5 minutes per day

reaches almost 1152 minutes (19 hours) for those 65 and older. The changes are less pronounced for women, declining from about 917 minutes (15 hours) per day for 12-17 year olds to 862 minutes (14 hours) for those aged 18-24. It then rises to about 960 minutes (16 hours) for those 25-54, rising again to 1114 minutes (18 hours) for those aged 55-64 and to 1191 minutes (20 hours) for those aged 65 and above.

This overall pattern does not hold true for rooms in the house. For example, average time in the kitchen increases regularly with age both for men (from 27 minutes for those aged 12-17 to 104 minutes for those aged 65 and over) and for women (from 42 minutes for those aged 18-24 to 154 minutes for those aged 65 and older). Time in the living room shows similar low points for teenagers and tends to increase with age.

Time spent in away-from-home locations, of course, shows the reverse trend, with away time generally tending to decline with age. Again, away-from-home time reaches a peak in the 25-34 age group for men, being about 100 minutes per day higher than among men under the age of 18, 160 minutes higher than among 55-64 year old men and more than 300 minutes per day higher than among men over the age of 65. Among women, away-from-home time peaks at 457 minutes per day (53 hours per week) for the 18-24 year old age group, compared to 425 minutes per day (50 hours per week) for 'girls 12-17' years old, and about 378 minutes (about 44 hours per week) for women aged 25 to 34, 239 minutes per day (28 hours per week) for women aged 55-64 and 175 minutes per day (20 hours per week) for women over age 65.

Travel time, on the other hand, is not lower among teenagers but stays rather steady until age 65 for both men and women. Travel times

of those aged 65 and older (81 minutes per day for men, 71 minutes for women) are somewhat lower than for other age groups. A similar lack of age patterns shows up again in the figures for automobile-van-truck travel. The times spent in other transit modes (bus, train, etc.) are generally too small to show a regular pattern, although it is clear that bicycle and motorcycle travel times are higher among young men.

Finally, time spent in outdoor locations is two to three times greater for men than women. Again, the lack of age pattern showed up within gender.

Region: The regional differences in Table 3.4 with respect to time at home, time away from home, and in-transit time are statistically significant. The time spent at home varies between 883 minutes per day (103 hours per week) in the South Coast Region to 929 minutes per day, (108 hours per week) in the San Francisco Bay Area, and 960 minutes (112 hours per week) in other areas of the state. Differences are pronounced for time spent in the kitchen of the home, which is 58 minutes per day in the South Coast Region compared to 86 minutes in the San Francisco Bay Area and other areas of the state. Time spent in other living areas of the house (living rooms, dining rooms, studies, etc.) are rather similar across the three regions. However, for some location categories such as yard work, the regional differences are comparable to differences by gender and employment status.

Time spent in away-from-home locations is higher in the South Coast Region (434 minutes per day) than the San Francisco Bay Area or other areas of the state. This is mainly reflected in the longer time in offices, other outdoor locations, shopping malls, and other public

MEAN TIME SPENT IN VARIOUS LOCATIONS BY REGION
(in minutes per day; includes non-participants)

	South Coast Region	S.F. Bay Area	Other Areas of State	
n =	(328)	(381)	(1053)	
AT HOME				
1. Kitchen	58	86	84	
2. Living Room	190	178	216	
3. Dining Room	17	22	25	
4. Bathroom	33	34	33	
5. Bedroom	525	528	520	
6. Study	8	9	6	
7. Garage	6	17	8	
8. Basement	*	2	*	
9. Utility Room	2	1	4	
10. Pool, spa	*	*	1	
11. Yard	21	22	37	
12. Room to Room	20	26	21	
13. Other HH Room	2	4	6	
TOTAL AT HOME	883	929	960	Sig.
AWAY				
21. Office	85	83	44	
22. Plant	41	33	28	
23. Grocery Store	10	11	17	
24. Shopping Mall	38	39	25	
25. School	41	36	43	
26. Other Public Places	15	9	14	
27. Hospital	13	14	16	
28. Restaurant	31	28	25	
29. Bar-Nightclub	10	5	8	
30. Church	5	4	10	
31. Indoor Gym	4	4	4	
32. Others Home	50	70	66	
33. Auto Repair	14	8	8	
34. Playground	17	8	9	
35. Hotel-Motel	9	5	5	
36. Dry Cleaners	*	2	*	
37. Beauty Parlor	2	1	2	
38. Moving around	1	2	3	
39. Other Indoor	14	8	12	
40. Other Outdoor	33	30	35	
TOTAL AWAY	434	401	374	Sig.

* Less than 0.5 minutes per day

Sig = Difference between regional groups statistically significant at the .05 level.

NS = Difference not statistically significant.

(Other differences in the table were not tested for statistical significance.)

MEAN TIME SPENT IN VARIOUS LOCATIONS BY REGION
(in minutes per day; includes non-participants)

	South Coast Region	S.F. Bay Area	Other Areas of State	
n =	(328)	(381)	(1053)	
TRAVEL				
51.Car	78	72	69	
52.Van	21	12	18	
53.Walking	11	12	8	
54.Bus Stop	*	2	1	
55.Bus	5	5	2	
56.Rapid Train	2	1	*	
57.Other Truck	*	2	2	
58.Airplane	1	*	1	
59.Bicycle	1	1	2	
60.Motorcycle	2	1	1	
61.Other	1	*	*	
TOTAL TRAVEL	121	108	103	Sig
99.Unknown location	2	3	3	
GRAND TOTAL	1440	1440	1440	
TOTAL OUTDOORS	72	61	83	Sig
TOTAL INDOORS	1245	1268	1251	NS
TOTAL IN TRANSIT	121	108	103	Sig

* Less than 0.5 minutes per day
Sig = Difference between regional groups statistically significant at the .05 level.
NS = Difference not statistically significant.
(Other differences in the table were not tested for statistical significance.)

places. Residents of the South Coast Region spent less time in stores and in other people's homes than those in other areas of the state.

Average time spent in transit is different across the state, varying from 121 minutes per day in the South Coast Region to 103 minutes in the other areas of the state. The times for the major travel means, automobile-vans-trucks, are about 10% higher in the South Coast Region than in the San Francisco Bay Area and other areas of the state.

Time spent in outdoor locations is also higher in other areas of the state (83 minutes per day; 10 hours per week), compared to the South Coast Region (72 minutes per day; 8 hours per week) and the Bay area (61 minutes per day; 7 hours per week). Regional differences in indoor time, however, are not statistically different.

Season: Time spent at home is significantly different among seasons, as can be seen in Table 3.5. Thus, for example, time spent at home varies from 940 minutes per day (110 hours per week) in the fall and winter, to about 900 minutes per day (105 hours per week) in the summer and spring. Time spent in the yard (and pools, spas, etc.) is, of course, highest in the summer (45 minutes per day) versus spring (26 minutes), fall months (25 minutes) or winter months (16 minutes).

Average time spent in locations away from home is about 25 minutes per day higher in spring and summer months than the rest of the year. However, these seasonal differences are not significant statistically. Notable seasonal increases appear for time at other public places in the spring and for hospitals in the summer. Time in park or playgrounds is highest in the fall. Time in "other" outdoor locations away from home is of course highest in the summer.

MEAN TIME SPENT IN VARIOUS LOCATIONS BY SEASON
(in minutes per day; includes non-participants)

	Fall	Winter	Spring	Summer	
n =	(488)	(473)	(290)	(511)	
AT HOME					
1. Kitchen	76	71	82	67	
2. Living Room	212	192	175	206	
3. Dining Room	18	23	20	23	
4. Bathroom	31	30	42	29	
5. Bedroom	531	568	502	496	
6. Study	7	8	3	12	
7. Garage	6	6	17	7	
8. Basement	*	*	*	1	
9. Utility Room	2	2	4	2	
10. Pool, Spa	*	*	*	3	
11. Yard	25	16	26	42	
12. Room to Room	29	22	17	20	
13. Other HH Room	2	4	4	5	
TOTAL HOME	940	943	890	911	Sig
AWAY					
21. Office	77	65	66	72	
22. Plant	37	32	36	34	
23. Grocery Store	13	13	10	14	
24. Shopping Mall	40	27	32	36	
25. School	39	53	48	22	
26. Other Public Places	11	9	25	8	
27. Hospital	7	14	8	28	
28. Restaurant	30	24	28	30	
29. Bar-Nightclub	4	7	10	11	
30. Church	8	8	6	4	
31. Indoor Gym	4	5	5	4	
32. Others Home	51	51	82	58	
33. Auto Repair	10	19	4	8	
34. Playground/park	18	9	11	12	
35. Hotel-Motel	9	4	4	10	
36. Dry Cleaners	2	*	*	*	
37. Beauty Parlor	3	4	*	1	
38. Moving	4	1	*	2	
39. Other Indoor	8	13	21	5	
40. Other Outdoor	16	35	28	53	
TOTAL AWAY	389	394	423	413	NS

* Less than 0.5 minutes per day

Sig = Difference between seasonal groups statistically significant at the .05 level.

NS = Difference not statistically significant.

(Other differences in the table were not tested for statistical significance.)

Table 3.5 (Continued)

MEAN TIME SPENT IN VARIOUS LOCATIONS BY SEASON

(in minutes per day; includes non-participants)

	Fall	Winter	Spring	Summer	
n=	(488)	(473)	(290)	(511)	
TRAVEL					
51.Car	70	65	89	69	
52.Van	17	16	19	19	
53.Walking	11	9	10	9	
54.Bus Stop	1	1	*	*	
55.Bus	2	3	1	10	
56.Rapid Train	3	1	*	*	
57.Other Truck	*	2	2	*	
58.Airplane	1	*	*	1	
59.Bicycle	1	1	*	2	
60.Motorcycle	1	*	2	2	
61.Other	*	*	*	1	
TOTAL TRAVEL	108	100	124	114	Sig
99.Unknown location	3	3	2	2	
GRAND TOTAL	1440	1440	1440	1440	
TOTAL OUTDOORS	59	60	65	109	Sig
TOTAL INDOORS	1271	1277	1249	1215	Sig
IN-TRANSIT	108	100	124	114	Sig

* Less than 0.5 minutes per day.

Sig = Difference between seasonal groups statistically significant at the .05 level.

NS = Difference not statistically significant.

(Other differences in the table were not tested for statistical significance.)

Travel time is higher in spring, mainly due to auto travel. Van travel increases slightly in the spring and summer months.

Total time outside increases in the summer months to 109 minutes per day (13 hours per week) as compared to 59-65 minutes (about 7 hours per week) for the rest of the year. Total time spent indoors is also significantly different by season of the year, being highest in the fall and winter months.

2. Time Spent in Various Activities.

Summarizing some of the main results from the diary data:

* Average time spent cooking was 38 minutes per day, with half of the sample (51%) engaging in some cooking activity on the diary day. Average cooking time per participant, then, was 75 minutes, with one respondent reporting a high of 465 minutes cooking on the diary day.

* Average time spent doing house cleaning was a little lower (34 minutes per day) than for cooking, and with a higher standard deviation around the mean (74 minutes vs. 58 for cooking). There was a lower participation ratio (39%), however, so that time per participant for cleaning (87 minutes) was higher than for cooking.

* Another activity with high potential for exposure concerned drinking or socializing at bars and lounges. The average time was only 3.7 minutes per day across the sample. At the same time, only 4% of the sample reported such activity so that the time per participant (101 minutes) was about as high as for eating.

* Thirteen percent of respondents had worked on a car (car repair) for an average of 48 minutes on the diary day.

Turning to the more detailed results, variations in times spent in various other activities are shown in more detail in Tables 3.6 through

3.10. Table 3.6 shows the data at the most basic level for the entire sample for the 26 activity categories used in these tables, including not only average times and standard deviations for the entire sample, but also average times for those engaged in the activity and the percentage of the sample who engaged in the activity during the diary day.

Thus the figures for meals and eating in the first line of Table 3.6 refer to the average of 89 minutes per day spent eating for the entire sample and the standard deviation of 69 minutes around that average; since 95% of the sample reported eating at some point during the diary day, the average time per participant is 93 minutes for that 95%. Although 5% of the sample reported no activities coded in the "Eating" category (codes 06, 43, 44, 914, 954), some episodes of eating may have occurred during other activities (e.g., snacking while preparing food, or during other household work). The maximum time of 750 minutes per day is also shown along with the total sample size.

When averaged on a participant rate basis, the order of activities and average time per participant spent doing that activity was as follows:

- Sleep (506 minutes or 8.4 hours)
- Work (424 minutes or 7.1 hours)
- Education (237 minutes or 4 hours)
- Electronic media (184 minutes or 3.1 hours).

Thus sleep and work episodes are much longer in the diary than for other lengthy activities.

The smallest average durations per participant were for "other" activities (29 minutes), pet care (33 minutes) and errands (41 minutes).

Table 3.6
MINUTES OF TIME SPENT IN VARIOUS ACTIVITIES

Variable	Estimated Population Mean	Std Dev	Doer* Mean	% Reporting Activity	Maximum	N	Label
ACT1	88.7	69.4	93	95%	750	1762	EATING
ACT2	503.6	133.0	506	100%	1440	1762	SLEEPING
ACT3	193.6	241.4	424	46%	1200	1762	WORKING
ACT4	37.5	58.4	75	51%	465	1762	COOKING
ACT5	34.4	73.7	87	39%	630	1762	HOUSE CLEANING
ACT6	19.8	66.1	111	18%	780	1762	YARD WORK
ACT7	0.8	11.2	73	1%	170	1762	DRY CLEANERS
ACT8	108.5	104.4	118	92%	1320	1762	TRAVEL
ACT9	6.1	31.1	48	13%	535	1762	CAR REPAIR
ACT10	3.2	17.4	33	10%	480	1762	ANIMAL CARE
ACT11	18.3	53.1	79	23%	510	1762	CHILD CARE
ACT12	24.9	52.7	66	38%	480	1762	SHOPPING
ACT13	1.4	14.1	83	2%	390	1762	SERVICES
ACT14	7.5	27.1	41	18%	630	1762	ERRANDS
ACT15	50.3	61.0	58	87%	1170	1762	PERSONAL CARE
ACT16	45.7	120.5	237	19%	665	1762	EDUCATION
ACT17	15.7	45.6	88	18%	590	1762	ACTIVE SPORTS
ACT18	10.7	49.3	134	8%	540	1762	OUTDOOR RECREATI.
ACT19	5.1	29.3	114	4%	435	1762	HOBBIES
ACT20	2.8	21.3	106	3%	270	1762	SINGING/DANCING
ACT21	9.5	44.4	143	7%	555	1762	CULTURAL EVENTS
ACT22	55.5	94.9	115	48%	730	1762	SOCIALIZING
ACT23	3.7	22.8	101	4%	330	1762	BAR AND LOUNGES
ACT24	143.1	145.3	184	78%	1065	1762	ELECTRONIC MEDIA
ACT25	47.6	86.0	104	46%	1050	1762	READING, WRITING
ACT26	2.3	15.6	29	8%	450	1762	OTHER

* "Doer" refers to those who reported participating in a given activity.

Lowest participation rates were for dry cleaners, personal care services, hobbies, singing/dancing, and bars and lounges -- all of which had less than 5% participation.

As in Tables 3.1 to 3.5 for location, these data are presented for the entire sample including adolescents. Time spent traveling is slightly lower in Table 3.6 than in Table 3.1, because walking for pleasure is included as walking in Table 3.1. but is included as part of active sports (code 17) in Table 3.6.

Gender and Employment Status Differences: Differences in these activities by gender and by employment status are shown in Table 3.7. These differences by both variables are among the largest found in analyses of the population by demographic factors, as has been found in previous time use research (e.g., Szalai *et al* 1972; Robinson 1977, Juster and Stafford 1985; Robinson 1988).

Thus we find men spending more time working, doing yard work, doing automobile repair, traveling and playing sports. Women, in contrast, spent more time cooking, doing housework tasks inside the home, taking care of children, doing shopping, engaging in personal care at home and by using services (e.g., beauty parlors), engaging in hobbies, socializing and reading.

In general, employed people spend lower amounts of time on education, outdoor recreational activities (mainly walking), reading and watching television.

For many activities, we find different patterns for employed men (versus non-employed men) and employed women (versus non-employed women). In free time activities, non-employed men spent more time playing active sports, while non-employed women spent no more time in

Table 3.7

MEAN TIME SPENT IN VARIOUS ACTIVITIES

(in minutes per day; includes non-participants)

	MEN			WOMEN		
Location	Not Employed	Employed	TOTAL	Not Employed	Employed	TOTAL
n =	(249)	(573)	(822)	(430)	(510)	(940)
AT HOME						
1. Eating	105	89	93	91	79	84
2. Sleeping	555	479	501	529	488	507
3. Working	28	328	245	12	252	144
4. Cooking	19	15	16	74	46	58
5. House cleaning	20	15	16	66	41	53
6. Yard work	36	20	25	21	11	15
7. Dry cleaners	*	*	*	3	*	2
8. Travel	110	128	123	77	109	95
9. Car repair	14	7	9	3	4	3
10.Animal care	3	3	3	4	3	4
11.Child care	9	8	8	37	21	28
12.Shopping	17	16	16	33	34	34
13.Services	*	*	*	4	1	2
14.Errands	6	8	8	8	7	7
15.Personal care	39	44	42	53	63	58
16.Education	107	23	47	72	22	44
17.Active Sports	37	16	22	11	8	10
18.Outdoor Recreation	20	14	16	7	6	6
19.Hobbies	3	2	3	12	4	7
20.Singing/dancing	2	4	3	3	2	2
21.Cultural events	4	8	7	6	17	12
22.Socializing	58	48	51	65	56	60
23.Bar and lounges	3	6	5	*	3	2
24.Electronic media	197	116	138	188	116	148
25.Reading,writing	50	39	42	62	46	53
26.Other	1	3	3	*	3	2
TOTAL	1440	1440	1440	1440	1440	1440

* Less than 0.5 minutes per day

active sports than employed women. Conversely, non-employed women spent more than twice as much time in hobby activities as employed women, although there are no differences between employed and non-employed men in hobby activities. The most prominent gender differentials of this type however are for family care activities. Non-employed women spent up to half again as much time as employed women in cooking, doing housework, taking care of children, and shopping, while non-employed men in some cases do less of these activities than employed men. And while non-employed men spend about the same time on personal care as employed men, non-employed women spend less time than employed women.

Age: The differences between older and younger men and women shown in Table 3.8 also differ depending on one's gender. Thus, time spent on hobbies increases for older women (versus younger women) but not for older men.

In general, however, those age patterns that are clear tend to be the same for men and women. Eating time, for example, tends to increase with age, although not in a clear linear progression for each older age group. Sleeping times are highest among adolescent boys and girls. Work time is highest among the middle aged, while housework (especially yard work) tends to increase with age.

Travel time is highest among the 18-24 age group (and the 45-54 age group for men) and drops off most noticeably among the 65 and over age group. Child care is of course highest in the 25-44 age group, while animal care is more constant across age groups. Shopping time is notably lower among adolescents and shows some decline for women (but not men) over the age of 64. Adolescent boys, but not girls, report

Table 3.8

MEAN TIME SPENT IN VARIOUS ACTIVITIES

(In minutes per day; includes non-participants)

	MEN							WOMEN						
Age	12-17	18-24	25-34	35-44	45-54	55-64	65+	12-17	18-24	25-34	35-44	45-54	55-64	65+
n =	(98)	(96)	(183)	(172)	(106)	(82)	(77)	(85)	(96)	(223)	(179)	(110)	(112)	(125)
1. Eating	77	85	77	95	104	124	125	62	59	82	76	104	101	115
2. Sleeping	571	500	500	483	453	493	537	555	522	515	469	510	503	485
3. Working	53	222	343	276	334	208	66	51	162	186	211	170	89	32
4. Cooking	5	12	14	21	21	21	20	11	27	67	76	55	70	80
5. House cleaning	13	27	9	19	15	11	22	18	32	53	56	63	79	64
6. Yard work	5	6	23	20	27	58	59	2	2	7	19	27	29	30
7. Dry cleaners	*	*	*	*	*	*	*	*	*	*	*	*	*	13
8. Travel	112	144	115	126	151	115	80	97	113	99	98	89	83	71
9. Car repair	7	5	11	9	9	14	5	1	4	5	3	4	3	1
10. Animal care	1	2	4	2	3	3	5	3	2	2	6	6	3	6
11. Child care	3	1	11	15	8	7	13	4	20	50	35	21	22	8
12. Shopping	4	26	14	19	16	13	18	18	34	42	31	34	39	27
13. Services	*	1	*	1	*	*	1	4	1	1	1	3	5	5
14. Errands	2	9	10	8	6	5	11	3	11	4	6	8	8	11
15. Personal care	42	42	37	47	46	45	39	67	52	62	50	51	61	61
16. Education	197	86	17	27	15	7	4	197	83	18	23	16	11	21
17. Active Sports	48	22	24	20	12	13	13	30	7	11	6	9	3	5
18. Outdoor Recreation	17	11	13	19	12	21	25	9	2	7	5	4	14	2
19. Hobbies	2	1	3	3	7	*	2	1	2	2	8	8	12	23
20. Singing/dancing	2	11	5	*	*	3	1	8	3	1	1	2	2	1
21. Cultural events	14	7	6	7	5	7	2	2	18	12	15	14	9	9
22. Socializing	90	64	40	51	34	45	46	92	69	51	58	58	59	50
23. Bar and Lounges	*	13	6	6	6	*	1	*	6	3	1	1	1	1
24. Electronic media	161	123	113	124	107	176	238	190	163	114	127	114	161	226
25. Reading, writing	13	17	44	41	51	44	107	15	41	42	55	66	74	92
26. Other	*	4	3	1	2	8	*	2	3	2	2	3	*	*
TOTAL	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440

* Less than 0.5 minutes per day.

less time on personal care. Adolescent boys and girls do spend far more time attending school and in other education activities.

With regard to free time activities, younger people in general spent the most time in active sports and in music and dance activities. Attending bars and lounges, on the other hand, is slightly higher among the 18-24 and 25-35 age groups. Television viewing and use of other electronic media shows a curvilinear pattern by age, being highest in the 12-17 and over-65 age groups and being lower among middle-age groups. Reading shows a more straightforward age gradient moving from 13 minutes per day among adolescent boys to more than 100 minutes per day for men aged 65 and over. Outdoor recreation peaks in the 65+ age group among men and in the 55-64 age group among women.

Region: As was the case for the location data, regional differences in Table 3.9 are less pronounced than those by age, gender or employment status. Time spent eating is slightly higher (by about an hour per week) in the San Francisco Bay area than in the South Coast Region, while sleeping time is more than two hours per week higher in other areas of the state than in the South Coast. Average aggregate work time, in contrast, is highest in the South Coast Region (222 minutes per day, 26 hours per week) than either in the San Francisco Bay area (194 minutes per day, 23 hours per week) or in other areas of the state (160 minutes per day, 19 hours per week).

Like eating times, cooking time is lowest in the South Coast Region. The same is true for yard work, and other household tasks. Total travel time (excluding walking for pleasure) is highest in the South Coast Region (117 minutes per day, 13.7 hours per week), next in the San Francisco Bay area (106 minutes per day; 12.4 hours per week)

Table 3.9

MEAN TIME SPENT IN VARIOUS ACTIVITIES BY REGION

(in minutes per day; includes non-participants)

Area	South Coast Region	S.F. Bay Area	Other Areas of State
n =	(328)	(381)	(1053)
1. Eating	87	97	85
2. Sleeping	492	508	514
3. Working	222	194	160
4. Cooking	33	40	42
5. House cleaning	32	37	36
6. Yard work	13	23	26
7. Dry cleaners	2	*	*
8. Travel	117	106	100
9. Car repair	6	7	5
10.Animal care	2	2	6
11.Child care	17	20	19
12.Shopping	27	27	21
13.Services	1	2	2
14.Errands	7	9	7
15.Personal care	51	47	51
16.Education	46	39	49
17.Active Sports	14	14	19
18.Outdoor Recreation	10	8	13
19.Hobbies	4	5	7
20.Singing/dancing	3	2	3
21.Cultural events	12	7	8
22.Socializing	60	47	56
23.Bar and lounges	4	3	4
24.Electronic media	137	134	157
25.Reading, writing	40	59	48
26.Other	2	3	2
TOTAL	1440	1440	1440

* Less than 0.5 minutes per day.

and lowest in other areas of the State (100 minutes per day, 11.7 hours per week).

Time spent in education, recreation, and socializing activities are each lowest in the San Francisco Bay area. Cultural activities are highest in the South Coast Region.

Electronic media time is about 15% higher (157 minutes per day; 18.3 hours per week) in other areas of the state than in either the San Francisco Bay area or the South Coast Region (134 and 137 minutes per day respectively). Reading and writing time is highest in the San Francisco Bay area, next highest in other areas of the state and lowest in the South Coast Region.

In summary, then, South Coast residents were highest among regions in the amounts of time at work and in travel. They are slightly higher in the time they spent at cultural events and socializing and lower in time they spent eating, cooking, sleeping, doing yard work and reading. San Francisco Bay area residents spent more time eating and reading than residents of the South Coast and other areas of the state. Residents of other areas of the state are highest in time spent in sleeping, yardwork, animal care, active sports, outdoor recreation and in electronic media. They spent less time working, traveling and shopping than residents of the South Coast Region or the San Francisco Bay area.

Season: As shown in Table 3.10, time spent eating was lowest in the winter (82 minutes per day) and highest in the fall (94 minutes per day). Sleeping times are higher in winter (525 minutes per day or 61 hours per week) than in the spring or summer (493 minutes per day or 58 hours per week).

Table 3.10

MEAN TIME SPENT IN VARIOUS LOCATIONS BY SEASON

(in minutes per day; includes non-participants)

	Fall (1987)	Winter (1988)	Spring (1988)	Summer (1988)
n =	(488)	(473)	(290)	(511)
1. Eating	94	82	92	86
2. Sleeping	502	525	493	494
3. Working	200	192	181	200
4. Cooking	34	39	43	34
5. House cleaning	33	28	40	37
6. Yard work	21	14	17	27
7. Dry cleaners	*	*	3	*
8. Travel	102	97	123	111
9. Car repair	5	7	7	5
10.Animal care	2	4	3	3
11.Child care	18	18	21	15
12.Shopping	35	19	24	22
13.Services	3	1	1	1
14.Errands	8	9	6	8
15.Personal care	49	54	51	46
16.Education	47	61	57	17
17.Active Sports	9	14	18	21
18.Outdoor Recreation	11	11	6	15
19.Hobbies	8	4	5	4
20.Singing/dancing	2	3	4	2
21.Cultural Events	12	7	9	10
22.Socializing	55	48	61	59
23.Bars and lounges	3	3	5	3
24.Electronic media	139	149	122	165
25.Reading, writing	49	45	44	53
26.Other	3	3	2	2
TOTAL	1440	1440	1440	1440

Time spent working declines in the winter months and more so in the spring. And times spent cooking and home cleaning were higher in the spring. Travel time was about 10 to 20 minutes more per day (or about an hour a week higher) in the spring and summer months than in the fall and winter months.

Times spent shopping and obtaining services were highest in the fall. Personal care time was at its lowest level in the summer months.

Classes and education were, of course, far lower in the summer months, while active sports and outdoor recreation rose to 36 minutes per day (4.2 hours a week) compared to 20-25 minutes (about 2.6 hours per week) during the rest of the year. Hobbies increased during the fall. Social life, singing/dancing and going to bars and lounges remained fairly steady across the year.

Electronic media time reached its highest point (165 minutes per day; 19.3 hours per week) during the summer months compared to the low of 122 minutes per day (14.2 hours a week) in the spring. Reading time also increased somewhat during the summer.

In summary, then, the summer period was distinguished by more time spent doing yardwork, playing active sports and recreation outdoors, experiencing electronic media, and reading. Less time was spent in the summer months in personal and child care, and attending classes. The fall months were distinguished by more time eating and shopping. Winter marked the high point for sleeping, personal care, and education, and the low point for eating, housecleaning, socializing, yardwork and travel. Spring marked the high point for cooking, housecleaning and traveling, and the low point for electronic media and working.

3. Percentages Reporting Use of, or Proximity to, Potential Pollutant Sources

As noted in Chapters 1 and 2, several ancillary questions were included in the survey specifically enquiring into the use of, or proximity to, potential pollutant sources on the previous day. Most of these were asked in the post-diary part of the questionnaire. These data are reported in summary fashion in Table 3.11, for both adults and adolescents; the specific questions are given in Figure 2.2 and Appendix B.

Some highlights from these questions are:

* Among the adult portion of the sample, about a fifth (22%) reported having smoked at least one cigarette on the diary day, with about half of these smokers having smoked more than 10 cigarettes. About 26% said they were at a gas station, parking garage or auto repair shop, with 16% of all adult respondents saying they had pumped or poured gasoline. It can be seen at the top of Table 3.11 that 62% of the adult sample reported having an attached garage or carport at their dwelling unit. Some 37% reported that a motor vehicle had been parked in that attached garage or carport at their home.

* In addition, about 39% of adult respondents reported being in a room with an operating gas stove or oven and 30% in a room heated by a gas furnace. More than 80% of the adult sample used or were near soaps or detergents. For other potential pollutant sources, the figures are: 37% personal care aerosol products, 27% cleaning agents, 12% solvents, 7% pesticides, 7% glues or adhesives, 5% latex paints and 5% oil-based paints.

PERCENTAGES OF RESPONDENTS REPORTING USE, PROXIMITY, POTENTIAL POLLUTANT SOURCES

	ADULTS (18+)	ADOLESCENTS
Have attached garage at home	62%	-----
Work with gas stoves, ovens	5	1
Work with open flames	6	2
Work with solvents, chemicals	20	6
Work with dust particles	25	13
Work with gasoline, diesel fuel/equipment	20	5
Work with other pollutants	11	2
USED OR WERE NEAR YESTERDAY		
Vehicle in attached garage	37	-----
Smoked cigarette	22	6
(Smoked > 10 cigs)	12	2
Smoked cigar/pipe	1	*
Gas station, auto repair, parking garage	26	33
(Station > 10 min.)	7	3
Pumped or poured gasoline	16	12
In room with gas stove/oven on	39	50
(Time > 10 min.)	30	30
Gas heat on	27	-----
(All heat on = 40%)		
Glues, adhesives	7	14
Oil-based paints	5	5
Water-based (latex) paints	5	5
Solvents	12	12
Pesticides	7	5
(Pesticides-indoors)	5	4
Soaps, detergents	83	79
Cleaning agents	27	25
Personal care aerosols	37	66
Hot shower	78	74
Hot bath, hot tub	11	17
Mothballs	10	-----
Toilet deodorizers	27	-----
Seented room fresheners	31	-----

* Less than 0.5 percent per day
----- Data unavailable

* About 80% of the sample reported taking a hot shower or bath on the diary day, mostly as showers. Use of scented room fresheners in the house was reported by 31% of the adult sample, of toilet deodorizers by 27% and of mothballs by 10%.

Among adults, some 5% reported working (once a week or more often) with gas stoves or ovens, 6% with open flames, 20% with solvents or chemicals, 25% with dust particles, 20% with gasoline or diesel vehicles/equipment, and 11% with other pollutants. These proportions were all lower for adolescents aged 12-17, being about half to a fifth as high as for adults. For examples, thirteen percent of all adolescents reported working with dust particles and about 5% with solvents or chemicals, or with gasoline/diesel vehicles/equipment on the job.

Activities involving use of hot water were of interest because of the potential for inhalation of chlorinated hydrocarbons from chlorinated water. More than three-quarters of adults (78%) reported taking a hot shower on the diary day, and 74% of adolescents. Fewer respondents (11% of adults and 17% of adolescents) reported taking a hot bath or being in a hot tub.

With regard to ventilation of the home, 75% of adults in the sample said they kept the windows in their home open at some point during the diary day. The estimated average amount of time that the window was open was 446 minutes (7.4 hours) between 6 a.m. and 6 p.m. and 385 minutes (6.4 hours) between 6 p.m. and 6 a.m. In addition 24% used a fan during the day and 11% used an air conditioner (of which more than half, or 6%, used a refrigeration-type air conditioner).

Gender and Employment Status: Differences within gender and employment categories in response to these ancillary questions are shown in Table 3.12. In terms of use of or proximity to possible pollution sources during general work time on the job (not only yesterday), employed men are significantly more likely to report potential exposure than are employed women. The largest significant differences are found for potential exposure to gasoline or diesel vehicles/equipment (43% men, 12% women), to solvents or chemicals (37% men, 20% women), to open flames (11% men, 5% women) and to gas stoves/ovens (9% men, 6% women). A nonsignificant gender difference is found for "other" potential pollutant sources at work (17% men, 15% women).

Turning to the use of or proximity to potential pollutant sources "yesterday," employed men and women engaged in such activities more often than non-employed men and women. Cigarette smoking was significantly higher among men. Significantly higher proportions of men and employed persons reported being at auto repair shops/gas stations/parking garages or pumping or pouring gas than women and unemployed persons, and the proportion who pumped gasoline was more than twice as high among men (23%) than among women (9%). Differences in proximity to operating gas ovens and stoves were not significant across gender or employment status.

In terms of use of or proximity to such potential pollutants as glues and personal care aerosols, significant differences were found across gender and/or employment status for all products except pesticides. Men, both employed and non-employed, used or were near oil-based paints more than women, and employed men used or were near water-based paints more than women. Employed men (20%) and employed women

Table 3.12: Percentage Differences in Responses to Ancillary Questions by Gender and Employment Status (Adult Respondents)

	MEN			WOMEN			
	Not Employed	Employed	TOTAL	Not Employed	Employed	TOTAL	
GENERAL							
Attached garage at home	50%	63%	60%	61%	64%	63%	
WORK WITH:							
Gas stoves, ovens	NA	9	7	NA	6	4	b
Open flames	NA	11	9	NA	5	3	b
Solvents, chemicals	NA	37	28	NA	20	12	b
Dust particles	NA	42	32	NA	30	17	b
Gasoline or diesel vehicles/equipment	NA	43	34	NA	12	7	b
Other pollutants	NA	17	13	NA	15	9	
...ID OR WERE NEAR YESTERDAY							
Vehicle in attached garage	27	39	36	40	38	39	c
Smoked cigarette	31	22	24	18	22	20	b,c
Smoked cigar/pipe	2	1	1	*	*	*	b,c
Auto repair/gas station/ parking garage	22	33	31	14	25	21	a,b
Pumped or poured gas	15	25	23	4	12	9	a,b
Gas stove/oven on	45	37	39	40	40	40	NS
Gas heat on	28	25	25	29	27	28	NS
...y heat	37	33	34	42	40	40	b
Glues, adhesives	5	7	7	5	8	6	a
Oil-based paints	6	8	8	1	2	1	b
Water-based paints	2	8	7	3	4	3	a,b
Solvents	7	20	17	3	9	7	a,b
Pesticides	8	8	8	8	6	7	NS
Soap, detergent	76	83	81	83	85	84	a,b
Cleaning agent	14	17	17	36	37	36	b
Personal care aerosols	25	28	28	38	51	45	a,b
Hot shower	72	86	83	64	80	73	a,b
Hot bath, tub	7	10	9	14	11	12	b
Mothballs	12	9	9	15	8	11	a
Toilet deodorizers	39	28	31	26	22	24	a,b
Scented room fresheners	33	27	28	33	33	33	b

* Less than 0.5 percent
NA = Not Applicable
a = significant at .05 level for employment status
b = significant at .05 level for gender
c = significant at .05 level for the interaction between gender and employment status
"-" = not significant at .05 level

(9%) used or were near solvents more than non-employed men (7%) and non-employed women (3%). In contrast, women were more likely to use or be near soaps and detergents (84%) than men (81%) and also more likely to be near cleaning agents and personal care aerosols than were men.

Women (12%) were significantly more likely than men (9%) to have taken hot baths or hot tubs. Use of mothballs was higher among the non-employed than the employed; use of toilet deodorizers was higher among non-employed men than other gender-employment groups and use of scented room fresheners was reported more by women (33%) than by men (28%).

Age: Table 3.13 shows several differences in levels of potential exposure by age. For example, it can be seen that potential exposure to solvents on the diary day is highest among men age 25-34 and women in the age 35-44 group (19% and 12% respectively), and lowest in the 65 and over age group.

Because of their lower employment rates, those aged 65 and over report far lower levels of potential exposures at the workplace. Even with their lower employment rates, however, about a fifth (13-21%) of those aged 55-64 report use of or proximity to solvents or chemicals, to dust particles, and to gasoline or diesel vehicles/equipment. Younger men report higher levels of proximity to these sources than older men; those aged 25-34 and 35-44 report higher levels of proximity to dust particles and other sources. Among women, reported proximity at the workplace is more level with age, with the exception of the higher exposure to solvents or chemicals, dust particles, gasoline or diesel vehicles/equipment, and other pollutants among the 35-44 age groups; these differences may also reflect higher employment rates in this age group.

Table 3.13: PERCENTAGES RESPONDING YES TO ANCILLARY QUESTIONS BY AGE AND GENDER (Adult Respondents)

	MEN						WOMEN						
Age	18-24	25-34	35-44	45-54	55-64	65+	18-24	25-34	35-44	45-54	55-64	65+	
GENERAL													
Attached Garage	49%	60%	68%	67%	56%	58%	55%	63%	73%	66%	63%	56%	a
WORK WITH:													
Gas stoves, ovens	13	6	6	8	8	*	5	3	3	7	*	5	b,c
Open flames	13	9	12	8	3	2	5	1	5	4	*	5	a
Solvents, chemicals	32	36	30	28	21	2	15	13	19	11	5	2	a
Dust particles	37	43	43	26	13	*	21	17	27	24	10	*	a
Gasoline or diesel vehicles/equipment	38	39	44	34	17	4	11	5	14	8	2	2	a
Other pollutants	6	22	16	9	5	2	11	11	12	8	3	2	a,b
USED OR WERE NEAR YESTERDAY													
Vehicle in attached garage	30	38	38	34	38	40	36	37	41	44	41	34	NS
Smoked cigarette	27	21	26	22	26	20	27	22	14	21	20	17	NS
Smoked cigar/pipe	*	*	*	4	2	6	*	*	*	*	*	*	a
Auto repair/gas station/ parking garage	28	37	29	28	34	20	26	20	26	24	14	10	a,b
Pumped or poured gas	22	28	23	18	27	11	12	8	12	7	6	5	a,b
Gas stove/oven on	46	44	38	28	38	24	34	40	45	35	38	45	c
Gas heat on	27	24	24	26	20	38	19	27	32	27	30	35	NS
Any heat	36	32	34	38	24	46	43	42	37	36	42	45	b
Glues, adhesives	8	10	7	4	3	3	8	4	11	9	4	2	a
Oil-based paints	10	11	5	6	6	6	2	1	2	2	1	1	b
Water-based paints	8	10	4	4	8	2	1	4	6	4	2	2	b
Solvents	18	21	16	14	19	4	6	7	12	8	6	*	a,b
Pesticides	4	7	11	6	9	10	8	6	8	18	4	1	c
Soap, detergent	81	84	73	84	90	76	70	84	90	84	90	86	a
Cleaning agent	18	14	19	19	14	16	33	37	40	42	36	25	b
Personal care aerosols	44	22	26	26	30	18	71	42	50	37	38	32	a,b
Hot shower	88	85	89	84	78	55	86	76	77	72	69	54	a,b
Hot bath, tub	11	10	11	4	7	12	10	13	9	13	12	15	NS
Mothballs	3	6	6	11	15	29	6	3	8	18	15	21	a
Toilet deodorizers	38	22	25	29	44	42	34	19	21	20	24	29	a,b
Scented room fresheners	34	28	24	24	27	35	43	30	32	28	36	33	b

* Less than 0.5 percent
a = significant at .05 level for age
b = significant at .05 level for gender
c = significant at .05 level for the interaction between gender and age
NS = not significant at .05 level

In terms of "yesterday" use or potential exposure, age differences in cigarette smoking are insignificant. Smoking of cigars and pipes, however, is highest among men aged 65 and over (6%), as well as men aged 45-54 (4%), but is almost non-existent among younger men and among women of all age groups.

Spending time at auto repair shops/gas stations/parking garages is higher among younger people and among men, ranging from 37% among men aged 25-34 to 10% among women aged 65 and over. The figures for pumping or pouring gasoline are also higher among young people, and are also about twice as high among men than women in all groups.

Being near operating gas stoves/ovens is not significantly different across age or gender groups, but these two factors show a significant interaction. Gender differences in potential exposure to any heating appliance are significant, with somewhat higher rates among women.

For many common sources of air pollution found in home or work environments, there are significant differences in potential exposure across age groups. Significant age differences are found with respect to potential exposure to glues, solvents, soaps and detergents, personal care aerosols, hot showers, mothballs and toilet deodorizers. In one case - for potential exposure to mothballs - the percentages tend to increase steadily with increasing age. In most instances, however, one or two age groups show elevated exposures relative to the other age groups.

Region: The first row of the regional differences shown in Table 3.14 shows that having an attached garage is eleven percentage points higher in the San Francisco Bay area (70%) than in the South Coast

Table 3.14

DIFFERENCE IN RESPONSES TO ANCILLARY QUESTIONS BY REGION (Adult Respondents)

	South Coast Region	S.F. Bay Area	Other areas of State	
GENERAL				
Attached garage at home	59%	70%	59%	Sig
WORK WITH:				
Gas stoves, ovens	5	5	6	NS
Open flames	4	7	7	NS
Solvents, chemicals	21	17	21	NS
Dust particles	22	25	27	NS
Gasoline or diesel vehicles/equipment	21	18	21	NS
Other pollutants	9	13	11	NS
USED OR WERE NEAR YESTERDAY				
Vehicles in attached garage	35	40	38	NS
Smoked cigarette	21	23	22	NS
Smoked cigar/pipe	*	*	1	NS
Auto repair/gas station/parking garage	30	22	22	Sig
Pumped or poured gas	19	11	14	NS
Gas stove/oven on	49	31	33	Sig
Gas heat on	24	31	27	NS
Any heat	30	42	42	Sig
Glues, adhesives	5	9	6	NS
Oil-based paints	4	5	5	NS
Water-based paints	5	5	6	NS
Solvents	14	10	10	NS
Pesticides	7	9	7	NS
Soap, detergent	82	84	82	NS
Cleaning agent	23	29	30	NS
Personal care aerosols	36	37	37	NS
Hot shower	84	73	75	Sig
Hot bath, tub	9	14	12	NS
Mothballs	10	10	10	NS
Toilet deodorizers	30	23	27	Sig
Scented room fresheners	34	28	29	NS

* Less than 0.5 percent

NS = Difference between regional groups not statistically significant at .05 level.

Sig= Difference between regional groups statistically significant at .05 level.

Region and other areas of the state (59%), and these differences are statistically significant. However, there are no significant regional differences in using an attached garage on the diary day.

No significant differences are found for potential exposure to most of the work pollutants by region of the state; however, the prevalence of being at auto repair shops/gas stations/parking garages "yesterday" is higher in the South Coast Region than in the other two areas of the state. Use of a gas stove/oven, taking a hot shower, and using mothballs are also higher in the South Coast Region, but use of gas furnaces or any heat source is lower than average.

Season: Differences in exposure by season of interview are shown in Table 3.15. There were significant differences by season in potential exposure to solvents and chemicals at work, but there were no significant seasonal differences with respect to other potential exposures at work.

With respect to potential exposures "yesterday", use of gas heat varied significantly over the seasons, being highest in winter (52%) and lowest in summer (2%). By far the largest and most seasonally-related difference occurs for use of any home heating which reaches a peak in the winter months at 76% daily use and is only 4% during the summer months.

There were significant seasonal differences with respect to use of, or proximity to, pesticides, hot showers, and scented room fresheners. Being near pesticides is higher in the summer as compared with other seasons. Hot shower use is lowest in the spring and summer months. Use of scented room fresheners is highest in the fall and winter months.

Table 3.15

DIFFERENCE IN RESPONSES TO ANCILLARY QUESTIONS BY SEASON (Adult Respondents)

	Fall (445)	Winter (426)	Spring (267)	Summer (458)	
GENERAL					
Attached garage	56%	61%	67%	63%	NS
WORK WITH:					
Gas stoves, ovens	6	3	8	6	NS
Open flames	4	5	8	7	NS
Solvents, chemicals	20	14	22	23	Sig
Dust particles	22	25	24	27	NS
Gasoline or diesel vehicles/equipment	18	21	22	20	NS
Other pollutants	9	10	11	13	NS
USED OR WERE NEAR YESTERDAY					
Vehicles in attached garage	38	35	37	39	NS
Smoked cigarette	22	23	17	27	Sig
Smoked cigar/pipe	*	*	1	*	NS
Auto repair/gas station/parking garage	27	22	29	24	NS
Pumped or poured gas	16	13	18	15	NS
Gas stove/oven on	50	39	34	33	NS
Gas heat on	32	52	22	2	Sig
Any heat	42	75	28	3	Sig
Glues, adhesives	8	7	5	6	NS
Oil-based paints	5	4	4	5	NS
Water-based paints	5	5	5	6	NS
Solvents	12	9	12	14	NS
Pesticides	8	5	6	11	Sig
Soap, detergent	85	82	81	84	NS
Cleaning agent	28	25	25	30	NS
Personal care aerosols	37	41	36	33	NS
Hot shower	80	84	76	73	Sig
Hot bath, tub	12	11	11	10	NS
Mothballs	12	9	10	9	NS
Toilet deodorizers	26	31	27	25	NS
Scented room fresheners	38	38	25	23	Sig

* Less than 0.5 percent

NS = Difference between seasons not statistically significant at .05 level.

Sig= Difference between seasons statistically significant at .05 level.

4. The Presence of Others Smoking

The final feature of each diary entry concerned the presence of other persons smoking during the activity. Unlike the earlier tables in this chapter, data here refer to episodes and not individuals and the data are not weighted for season or sampling probabilities. Of the 36,918 activities that were reported in the diaries, the answer "yes" (smoker was present) was reported for 3404 activities or about 9% of them. The mean length of time per episode for those 3404 activities with others smoking was 84 minutes. Based on weighted data, some 61% of adults and 70% of adolescents were in the presence of others smoking on the diary day. For such persons, the mean time for all activities with others smoking was 294 minutes for adults and 228 minutes for adolescents. In addition, 22% of the adult sample said they had themselves smoked on designated day, and 12% had smoked more than 10 cigarettes; cigar and pipe smoking on the diary day was reported by less than 1% of the respondents.

Location Difference: Variations in presence of others smoking by the location of activity are shown in Table 3.16. The first column shows the total number of episodes in each location across all respondents, and the second column the number of episodes with the presence of others smoking. The third column shows the percentage involved, that is the number in column 2 divided by the number in column 1. Thus there were a total 4050 diary activities that took place in a kitchen and 218 in the presence of others smoking, which works out to an overall proportion of 5%; this is below the overall average of 9% across

Table 3.16

ACTIVITIES AND EPISODES WITH OTHERS SMOKING AT VARIOUS LOCATIONS (Unweighted Data)

	Number of Activity Episodes	Activity Episodes with Others Smoking	% of Episodes with Others Smoking	Mean Time per Episode (in minutes per day)
AT HOME				
1. Kitchen	4050	218	5%	44
2. Living Room	4653	442	9	88
3. Dining Room	965	57	6	52
4. Bathroom	2308	29	1	27
5. Bedroom	5962	122	2	125
6. Study	171	13	8	99
7. Garage	239	12	5	83
8. Basement	13	2	15	0
9. Utility Room	143	2	1	53
10.Pool, spa	41	2	5	60
11.Yard	964	60	6	70
12.Room to Room	679	41	6	72
13.Other HH Room	155	9	6	11
AWAY				
21.Office	841	188	22	153
22.Plant	340	125	37	173
23.Grocery Store	522	54	10	108
24.Shopping Mall	755	120	16	86
25.School	931	74	8	80
26.Other Public Places	245	62	25	135
27.Hospital	284	37	13	133
28.Restaurant	778	327	42	68
29.Bar-Nightclub	133	104	78	99
30.Church	155	2	1	85
31.Indoor Gym	127	7	5	116
32.Others Home	1495	323	22	84
33.Auto Repair	315	63	20	105
34.Playground	248	51	21	120
35.Hotel-Motel	99	12	12	112
36.Dry Cleaners	10	1	10	580
37.Beauty Parlor	49	9	18	138
38.At varying locations	38	10	26	189
39.Other Indoor	205	67	33	99
40.Other Outdoor	793	180	23	97

Table 3.16 (Continued)

ACTIVITIES AND EPISODES WITH OTHERS SMOKING AT VARIOUS LOCATIONS (Unweighted Data)

	Number of Activity Episodes	Activity Episodes with Others Smoking	% of Episodes with Others Smoking	Mean Time per Episode (in minutes per day)
TRAVEL				
51.Car	5420	323	6	33
52.Van	1152	103	9	36
53.Walking	1080	115	11	15
54.Bus Stop	75	11	15	27
55.Bus	111	8	7	177
56.Rapid Train	17	2	12	243
57.Other Truck	74	4	5	16
58.Airplane	18	4	22	61
59.Bicycle	133	5	4	31
60.Motorcycle	66	2	3	43
61.Other transportation	22	2	9	33
99.Unknown location	49	5	10	266
TOTAL	36918	3404	9	84

all locations and indicate that kitchens are relatively unlikely places for others smoking.

Locations with the highest percentage of episodes with the presence of others smoking were bars and nightclubs (78%), restaurants (42%), plants/factories (37%), other indoor (33%), and other public places (25%). A low incidence of others smoking was reported in bathrooms and utility rooms in the home (1%) or at churches in away-from-home locations. Only 2% rates were reported in bedrooms.

The final column in Table 3.16 shows the average length of time in locations with others smoking. Outside of the single lengthy episode of one respondent at a dry cleaners, the highest times per episode are for traveling on a train (243 minutes), moving around at work/other locations (189 minutes), working at a plant (173 minutes), traveling on buses (177 minutes), working in an office (153 minutes) and being in a hospital or other public places (133 and 135 minutes). This may be as much a function of the length of the activity episodes that take place in these locations as of the smoking habits at the locations themselves. The same is true for the lowest average figures: other travel (16 minutes), walking (15 minutes), bus stop (27 minutes), and motorcycle/bicycle travel (31-43 minutes).

Activity Differences: There are also pronounced differences in the presence of others smoking by type of activity. Organized in the same manner as Table 3.16, Table 3.17 first shows the number of episodes of each of the 26 types of activities (cf. Table 2.5), and then the number of episodes with others smoking. The third column shows the proportion of episodes in the presence of others smoking; as, for

Table 3.17

EPISODES WITH OTHERS SMOKING FOR VARIOUS ACTIVITIES (Unweighted data)

	Number of Activity Episodes	Activity Episodes with Others Smoking	% of Episodes with Others Smoking	Time per Episode (in minutes per day)
1. Eating	3929	592	15%	49
2. Sleeping	3507	59	2	250
3. Working	1761	459	26	211
4. Cooking	2174	113	5	35
5. House cleaning	1481	61	4	58
6. Yard work	580	25	4	89
7. Dry cleaners	11	0	0	0
8. Travel	8169	585	7	32
9. Car repair	283	32	11	28
10.Animal care	346	9	3	28
11.Child care	1049	74	7	51
12.Shopping	1018	125	12	62
13.Services	43	5	12	88
14.Errands	476	37	8	36
15.Personal care	3925	87	2	33
16.Education	1033	49	5	80
17.Active Sports	469	29	6	82
18.Outdoor Recreation	201	52	26	152
19.Hobbies	121	9	7	55
20.Singing/dancing	65	19	29	89
21.Cultural events	157	48	31	136
22.Socializing	1716	365	21	80
23.Bar and lounges	77	64	83	79
24.Electronic media	2681	320	12	108
25.Reading,writing	1476	108	7	56
26.Other	170	78	46	18
	36918	3404	9	84

example, 15% of eating episodes, making that an above average activity with respect to others smoking.

Again the highest level of others smoking in Table 3.17 is for activities at bars and lounges (83%). About half (47%) of activities in the "other" category (mainly consisting of employment-seeking activities) were in the presence of others smoking and the rates for cultural events (mainly movies), singing and dancing, outdoor recreation, working and socializing were also well above average -- between 21% and 31% -- vs. 9% for all activities. Low rates exposure occasions included such "solo" activities as sleeping (2%), grooming and personal care (2%), animal care (3%), education (5%), yard work (4%) and house cleaning (4%).

Chapter IV. DISCUSSION OF MAJOR RESULTS

1. Highlights of Some Main Findings

In this first study of how residents of the state of California use time, several time estimates and measurements were obtained and some initial tabulations have been presented in the previous chapters. We present some of the estimates relevant to potential for exposure to pollutants below:

1) Average time in varying locations: On average, nearly 21 hours per day (87% of the time) was spent indoors, and 71% of that time was spent in the home. Less than two hours per day (or about 5% of time) was spent outdoors, although that figure reaches nearly 11% of time for men aged 55-64. Outdoor time was mainly spent in one's yard, patio or pool/spa (28 minutes per day), in parks (12 minutes) and walking (10 minutes). Some 8% of Californians' time was spent in travel (82% of this in cars or vans).

2) Average time in varying activities: Total average time spent cooking was 38 minutes per day for the whole sample, but 58 minutes per day for women and 74 minutes per day for women not in the paid labor force. Time spent house cleaning was 34 minutes for the whole sample, 53 minutes for women and 66 minutes for women not in the paid labor force. Mean time spent socializing at bars and lounges was 4 minutes overall, 6 minutes among employed men and 13 minutes among men aged 18-24.

On the average diary day, 504 minutes were spent sleeping, 89 minutes eating meals, and 50 minutes in personal hygiene and personal care. On the average, respondents spent 194 minutes working, 109 minutes traveling, 34 minutes doing housecleaning and 25 minutes shopping. Free time included electronic media time (143 minutes), socializing (56 minutes), reading (48 minutes) and playing active sports (16 minutes). Among respondents aged 12-17, 687 minutes were spent on eating, sleeping and personal care. Other activities included attending school and doing homework (197 minutes), using the electronic media (174 minutes), socializing (91 minutes), housecleaning and shopping (26 minutes), and playing active sports and recreation (53 minutes); adolescents spent 105 minutes per day traveling.

3) Time in the presence of others smoking: Based on weighted data, about 62% of adults and adolescents of Californians were in the presence of others smoking during the diary day. For such persons, the average duration of all activities with others smoking was 286 minutes per day, or about 33 hours per week. Based on unweighted counts of diary episodes where others smoking were present, the locations with the highest rates of others smoking included bars and nightclubs (78%), restaurants (42%), work locations (office and plant) (27%), other public places (25%), and parks and playgrounds (21%). The activities associated with above average rates of others smoking were drinking and socializing at bars and

lounges (83%), attending cultural events (31%), engaging in outdoor recreation (26%), and dancing and singing (29%).

In addition, based on weighted data, 22% of adult Californians reported smoking on the designated day, and 12% smoked more than 10 cigarettes; cigar and pipe smoking on the day was reported about 1% of the adult sample.

4) The following percentage of California adults reported they were near or used the following products:

Soaps, detergents	83%
Hot showers	78%
Gas stoves/ovens on	39%
Vehicle in attached garage	37%
Personal care aerosols	37%
Scented Room fresheners	31%
Cleaning agents	27%
Gas heat on	27%
Toilet deodorizers	27%
Auto repair/gas station/parking garage	26%

In addition, 12% were near solvents, 10% were near mothballs, 11% had taken a hot bath or hot tub and 16% had pumped or poured gasoline on the day; another 7% reported being near pesticides. Some 7% had been near or used glues or adhesives, 5% water-based paints and 5% oil-based paints, with 5% near pesticides used indoors during the day.

The fact that 87% of the time of the average California adult or adolescent is spent indoors, and 71% of the indoor time is time in the home, suggests that careful study of the potential pollutant sources in indoor environments is a major priority. On an average day, large proportions of Californians use, or are near to, potential sources of pollutants in the home, as they engage in the normal course of activities related to cooking and eating, personal care, and maintaining the household. The estimates of time use and prevalence of proximity to pollutants reported herein, should provide a basis for evaluating the relative importance of indoor exposures in the daily lives of California residents.

Tobacco smoke is an ubiquitous source of air pollution in many California environments. Although an individual's exposure is strongly dependent on the locations that he or she frequents, a sizable fraction of the non-smoking California population is at risk of passive exposure for part of their day. Over longer durations, say a week or more, the population prevalence of some degree of passive exposure to tobacco smoke must be quite high. Although the 24-hour diary data surely underestimate such potential exposure for individuals, average rates and percentages for activities and locations provide a relatively accurate picture of the environments where passive exposure is most prevalent.

The average Californian adult or adolescent spends almost two hours per day (111 minutes) traveling from one location to another. Not surprisingly, most of the travel time (82%) is spent in automobiles or vans. California exceeds the national average in this respect (see below), mostly due to greater travel time connected with non-work activities. Thus potential exposures to pollutant sources connected

with automobile travel may be somewhat higher in California than in the nation as a whole.

2. Comparisons to National-Level Data:

As noted at the outset of this report, the field and design procedures that were employed were largely based on earlier national studies. Table 4.1 compares the results for activities of the California study for respondents aged 18 and over with those from the aged 18 and over portion (n = 5488) of the 1985 national study from the University of Maryland's *Americans' Use of Time* Project. These data are for all adults, male and female, over the age of 18 for the two data sources -- shown in minutes per day. Significant differences between the two samples at the .05 level are noted with an asterisk.

It needs to be noted at the outset that the University of Maryland study, as with earlier national studies, concentrated mainly on activities and not on locations. In fact, the location data for this national study have yet to be formatted for straightforward analysis, so that a table parallel to Table 4.1 for location cannot be constructed at this time. Moreover, the location codes are far less detailed for the 1985 national data than for the present data. For example, time spent outdoors was not clearly differentiated for many activities and mode of transportation for travel activities was not recorded. Thus, the data for California stand alone as the first to estimate these facets of human activity patterns. However, time spent in travel can be calculated, for the national data and, as we shall see, it is somewhat higher in California than nationally.

It also needs to be noted that certain modifications in the activity code were introduced into the California study, so that certain

TABLE 4.1: ACTIVITY DIFFERENCES BETWEEN ARB AND NATIONAL STUDIES

(in minutes per day for age 18+)

00-49 NON-FREE TIME	California	National	50-69 FREE TIME	California	National
00-09 PAID WORK	1987-88	1985-87	50-69 EDUCATION AND TRAINING	1987-88	1985-87
n =	(1579)	(5488)	n =	(1579)	(5488)
00 (not used)			50 Students' classes	8	6
01 Main job	205	193	51 Other classes	1	2
02 Unemployment	1	1	52 (not used)	-	-
03 Travel during work	7	NR	53 (not used)	-	-
04 (not used)	-	-	54 Homework	8	7
05 Second job	3	3	55 Library	0	1
06 Eating	5	7	56 Other education	1	1
07 Before/after work	1	2	57 (not used)	-	-
08 Breaks	2	3	58 (not used)	-	-
09 Travel to/from work	26	22	59 Travel, education	2	2
10-19 HOUSEHOLD WORK			60-69 ORGANIZATIONAL ACTIVITIES		
*10 Food preparation	30	41	60 Professional/union	0	0
11 Meal cleanup	11	11	61 Special interest	0	1
*12 Cleaning house	21	29	62 Political/civic	0	0
13 Outdoor cleaning	9	8	63 Volunteer/helping	1	1
*14 Clothes care	7	11	64 Religious groups	1	2
15 Car repair/maintenance (by R)	5	NR	*65 Religious practice	5	9
16 Other repairs (by R)	8	9	66 Fraternal	0	0
17 Plant care	3	4	67 Child/youth/family	1	1
18 Animal care	3	4	68 Other organizations	2	1
19 Other household	7	14	69 Travel, organizations	2	4
20-29 CHILD CARE			70-79 ENTERTAINMENT/SOCIAL ACTIVITIES		
20 Baby care	3	6	70 Sports events	2	2
21 Child care	6	7	*71 Entertainment, events	4	1
22 Helping/teaching	2	1	72 Movies	2	2
23 Talking/reading	1	1	73 Theatre	1	1
24 Indoor playing	2	3	74 Museums	1	1
25 Outdoor playing	2	1	*75 Visiting	25	31
26 Medical care - child	0	1	76 Parties	6	5
27 Other child care	2	2	77 Bars/lounges	4	5
28 At Dry cleaners	1	NR	78 Other social	1	1
29 Travel, child care	3	4	79 Travel, events/social	13	16
30-39 OBTAINING GOODS AND SERVICES			80-89 RECREATION		
30 Everyday shopping	9	7	80 Active sports	8	10
31 Durable/house shop	18	17	81 Outdoor	3	5
32 Personal services	1	1	82 Walking/hiking	5	5
33 Medical appointments	3	2	83 Hobbies	1	1
34 Govt/financial service	3	2	*84 Domestic crafts	4	9
35 Car repair services	1	NR	85 Art	0	1
36 Other repair services	0	3	86 Music/drama/dance	3	2
37 Other services	2	1	87 Games	5	8
38 Errands	1	1	88 Computer use	3	3
*39 Travel, goods and services	24	19	89 Travel, recreation	5	5
40-49 PERSONAL NEEDS AND CARE			90-99 COMMUNICATION		
40 Washing, etc.	20	23	90 Radio	2	3
*41 Medical care	4	1	91 TV	131	139
42 Help and care	4	4	92 Records/tapes	2	1
*43 Meals at home	47	54	93 Read books	5	7
*44 Meals out	27	19	*94 Reading magazines/other	17	11
45 Night sleep	480	465	95 Reading newspaper	11	11
46 Naps/day sleep	17	19	*96 Conversations	15	24
47 Dressing, etc.	16	25	97 Writing	9	5
*48 N.A. activities	2	15	98 Think, relax	9	11
*49 Travel, personal care	21	12	*99 Travel, communication	4	0

NR = Not recorded

* Difference between California and national data comparable and statistically significant at the .05 level.

comparisons cannot be made in a straightforward manner. In Table 4.1, for example, it can be seen that no national data were calculated for travel during work, personal car repair/maintenance, car repair/maintenance done by others and time at the dry cleaners, as they were in the California study. Other changes in activity coding were introduced to make the codes more relevant for environmental research than sociological analysis. Thus, paying household bills was coded under correspondence (code 97) rather than as other housework (code 19), reading the Bible was coded as book reading (code 93) rather than as a religious activity (code 65) and organizational activity outside of religion was not closely monitored. Therefore, no significance tests can be conducted on these comparisons.

Finally there is a three-year time interval between the national data collection and the California survey. However, the University of Maryland did an additional small time-diary study in 1987, with results that were not that different from the 1985 study. It is also the case that relatively few significant differences were found in the 1985 national study from those which were found in the 1975 national study.

The first set of numbers in Table 4.1 shows similar figures for work. Californians average 205 minutes per day (23.9 hours per week) compared to 193 minutes (22.5 hours per week) for the 1985 national sample. Time spent in unemployment activities and second jobs are also rather similar in the two surveys, and while meals at the workplace are lower in the California study; that may be due to the greater number of work lunches in California taken at a restaurant away from the workplace. Time spent at work breaks is similarly lower in the California study, as is time spent getting ready to go to work or to

leave work. Commuting time in California (26 minutes) is not significantly higher than the figure for the nation as a whole (22 minutes).

Time spent doing household chores is significantly lower in California for many tasks: cooking (30 minutes vs. 41 minutes nationally), general house cleaning (21 vs. 29), and laundry (7 vs. 11).

Overall time spent in all child care activities is very close in California (22 minutes) to that nationally (26 minutes). Californians spent slightly more of their child care time in helping children with homework -- and slightly less in general custodial care, such as feeding and dressing children.

Total shopping and service time is higher in California (61 minutes per day) than that reported nationally (53 minutes). The major statistically significant difference is for travel related to shopping, which is 24 minutes in California vs. 19 nationally.

Time spent sleeping in California is very close to that nationally, as is true for naps and resting. Personal grooming time (codes 40 and 47) is lower in California (36 vs. 48 minutes), but personal medical care is significantly higher in California. Meals at home are significantly lower in California (47 vs. 54 minutes), but meal times at restaurants are significantly higher (27 minutes vs. 19 nationally). That also accounts for the greater travel time for meals and other personal care in California (21 minutes vs. 12 nationally).

Education-related activity time for California activities is about an hour a week, much as it is nationally. Time spent related to organizational activity is lower in California, and that is mainly due

to the lower time spent related to religious activities in California -- only about half of that reported nationally.

Time spent attending entertainment events is significantly higher in California. But there is lower time spent visiting (code 75) (25 minutes per day in California vs. 31 minutes per day nationally).

Recreational time in California is rather close to that nationally. Walking and or going to parks is about the same and hobby-craft-art activities are significantly lower in California compared to the national data.

The final set of figures in Table 4.1 shows that television time in California (131 minutes per day) is practically identical to that nationally (139 minutes per day). However, Californians report significantly more conversation time than the national estimate.

In summary, then, Californians spent about the same time shopping and obtaining services and less time doing most housework activities. They spent less time in personal hygiene and grooming but more time eating out. In terms of free time, Californians spend about the same time playing outdoor sports and reading, but less time in religious activities and doing domestic crafts. Overall travel time is higher for Californians (107 minutes vs. 84 nationally), due mainly to significantly greater times spent in travel related to shopping, eating out and the commute to work.

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Appendix A

Complete Activity Code

A P P E N D I X A

REVISED ACTIVITY CODES FOR ARB STUDY TIME USE DIARIES

01-09:|| Work and Other Income Producing Activities

01: WORK

Main job: activities at the main job and overtime; "working," "at work."

Work at home; work activities for pay done in the home when home is the main workplace. i.e., Self-employed people running a business out of the home.

Additional work home; additional job (i.e., consulting, cottage industry)

Work at home for no pay, work connected with main job.

Other work at home - general

Reading (work brought home)

02: UNEMPLOYMENT
Job search; looking for work, including visits to employment agencies, phone calls to prospective employers, answering want ads.

Unemployment benefits; applying for or collecting unemployment compensation.

Welfare; food stamps; applying for or collecting welfare food stamps.

03: TRAVEL DURING WORK

05: OTHER PAID WORK

Other paid work; second job; paid work activities which are not part of the main job (use this code when R clearly indicates a second job or "other" job); paid work for those no having main job; rental property.

(YOUTH DEFINITION): Part-time jobs when R is full-time student.

06: EATING AT WORK
Eating while working; drinking coffee as a secondary activity while working (at work place)

Lunch at workplace; lunch eaten at work, cafeteria lunchroom at work or at school

07: ACTIVITIES AT WORK
Activities at the workplace before starting or after stopping work; include "conversations," other work.

Other work related

08: BREAKS
Coffee breaks and other breaks at the workplace; "took a break"; "had coffee"

09: TRAVEL TO/FROM WORK
Travel to and from workplace, including waiting for transport

Travel related to job search, unemployment benefits, welfare, food stamps, waiting for related travel

Interrupted travel to work; travel to and from workplace when R's trips to and from work were both interrupted by stops;

Waiting for related travel

10-19: Household Activities

10: FOOD PREPARATION
Meal preparation; cooking, fixing lunches

Serving food, setting table

Preserving foodstuffs (cleaning, canning, pickling)

11: FOOD CLEANUP
Doing dishes, rinsing dishes, loading dishwasher

Meal cleanup, clearing table, unloading dishwasher

12: CLEANING HOUSE
Miscellaneous "work around house"; not ascertained if indoor or outdoor

Routine indoor cleaning and chores, picking up, dusting, making beds, washing windows, vacuuming, "cleaning," "fall/spring cleaning," "housework"

124: Cleaning and laundry together

13: OUTDOOR CLEANING
Routine outdoor cleaning and chores; yard work, raking leaves, mowing grass, garbage removal, snow shoveling, putting on storm windows, cleaning garage, cutting wood

14: CLOTHES CARE
Washing clothes

Other clothes care

149:At laundromat

15: CAR REPAIR/MAINTENANCE BY RESPONDENT
Routine car care at home; necessary repairs and routine care to cars; tune up

Car maintenance; changed oil, changed tires, washed cars; "worked on car"

Customize car, body work on car.

16: REPAIRS DONE BY RESPONDENT
Indoor repairs, maintenance, fixing, furnace, plumbing

Outdoor repairs; maintenance, exterior; fixing repairs outdoors, fixing the roof, repairing the driveway (patching)

Home improvements; additions to and remodeling done to the house garage; new roof

Carpentry/wood working

Repairing appliances

Repairing furniture, leisure equipment

Improvements to grounds around house; repaved driveway

165:Darkroom photographic work
166:Repairing boats,etc.
167:Painting a room or a house
169:Building a fire

17: PLANT CARE
Gardening; flower or vegetable gardening; spading, weeding, composting, picking, "worked in garden"

Care of house plants

18: PET AND ANIMAL CARE

Play with animals

Care of domestic household pets

Feeding of chickens, cows, pigs etc.

19: OTHER HOUSEHOLD
Other indoor chores; not ascertained whether cleaning or repair

Garage sales

Wrapping packages; packing clothes

Watching another person do household tasks

Loading and unloading the car; putting away groceries

Other household chores

20-29: Child Care

20: BABY CARE
Baby care; care to children age 4 and under

Feeding baby

21: CHILD CARE
Child care; mixed ages or ages of children not ascertained

Care to children ages 5-17

22: HELPING/TEACHING
Helping/teaching children learn/fix/make things

Helping kids with homework or supervising homework

telling them to behave

Disciplining child; yelling at kids, spanking children

Reading to child

Conversations with household children only; listening to children

24: INDOOR PLAYING
Playing with babies indoors

Indoor playing with kids; other indoor activities with children including games ("playing" unless obviously outdoor games)

25: OUTDOOR PLAYING
Leading outdoor activities; coaching, non-organizational activities

Outdoor playing with kids; including sports, walks, biking with, other outdoor games

26: MEDICAL CARE - CHILD
Medical care at home or outside home; activities associated with children's health, "took son to doctor," "gave daughter medicine"

27: OTHER CHILD CARE
Coordinating child's social or instructional non-school activities

Babysitting (unpaid) or child care outside R's home or to children not residing in HH

Other child care, including phone conversations relating to child care other than medical

Pick up/drop off children

28: DRY CLEANING ACTIVITIES
Pick up/drop off dry cleaning.

29: TRAVEL RELATED TO CHILD CARE
Related travel, including walking to and from school

30-39: Obtaining Goods and Services

30: EVERYDAY SHOPPING
Shopping for food, grocery shopping

Picking up fast food orders to go

31: DURABLE/HOUSE SHOP
Shopping; for clothing, small appliances; at drug stores, hardware stores, department stores, "downtown" or "uptown," shopping center, window shopping, at the mall

Shopping for durable goods; shopping for large appliances, furniture

Shopping for house or apartment; activities connected to buying, selling, renting, looking for house, apartment, including phone calls; looking at real estate property (for own use)

32: PERSONAL CARE SERVICES
Personal care services; beauty, barber shop; hairdressers

33: MEDICAL APPOINTMENTS
Medical services for self; doctor's appointment; pharmacist

34: GOVERNMENT/FINANCIAL SERVICES
Financial services; activities related to taking care of financial business; going to the bank, paying utility bills (not by mail), going to accountant, tax office, loan agency, insurance office

Other government services; post office, driver'slicense, sporting licenses, marriage licenses, police station

35: CAR REPAIR SERVICES
Buying gasoline

Auto services; repair and other auto services including waiting for such services

Having work done on cars -- not necessary to their running; customizing, painting etc.

Shop for cars, test drive

36: OTHER REPAIRS
Clothes repair, tailor

Having appliances repaired, including furnace, water heater, electric or battery operated appliances; including watching repair person

37: OTHER SERVICES
Other professional services; lawyer, counseling (therapy)

Other services; "going to the dump"

Renting and picking up various media and leisure materials e.g. videos, records, fishing gear

38: ERRANDS
Running errands; not ascertained whether for goods or services; borrowing goods

39: TRAVEL RELATED TO GOODS AND SERVICES
Travel related to obtaining goods and services

40-49: Personal Needs and Care

40: WASHING
Bathing; washing, showering; personal hygiene; going to the bathroom

41: MEDICAL CARE
Medical care at home to self

Medical care to adults in HH

42: HELP AND CARE
Non-medical care to adults in HH; routine non-medical care to adults in household

Help to relatives not in HH; helping, caring for, providing for needs of relatives; (except travel), helping move, bringing food, assisting in emergencies, doing housework for relatives; visiting when sick

Dropping adults at work, other locations

Help to neighbors, friends

Help to others, relationship to R not-ascertained

43: MEALS AT HOME
Meals at home; including coffee, drinking, food from a restaurant eaten at home, "breakfast," "lunch"

44: MEALS OUT
Meals at friends' home; eaten at a friend's home (including coffee, drinking)

Meals at restaurants

45: NIGHT SLEEP
Longest sleep of the day

46: NAPS/SLEEP
Naps and resting

47: DRESSING, GROOMING
Getting dressed or ready for bed

474: Washing AND Dressing

48: NOT ASCERTAINED ACTIVITIES
Time gap of more than 10 minutes

Personal/private; "none of your business"

Sex, making out

Affection between household members; giving and getting hugs, kisses, sitting on laps

Receiving child care; child is passive recipient of personal care; e.g., "Mom braided my hair"

Other personal care activities; watching personal care activities

49: TRAVEL RELATED TO PERSONAL CARE
Travel related to helping, including travel which is the helping activity; waiting for related travel

Other personal travel

Travel when purpose is not clear

50-59: Education and Professional Training

50: STUDENTS' CLASSES
Student attending classes full-time; includes daycare, nursery school for children not in school

51: OTHER CLASSES
Other classes, courses, lectures, academic or professional; R not a full-time student or not ascertained whether a student; being tutored

54: DOING HOMEWORK
Reading (class related)

Homework, studying, research

55: USING LIBRARY
Time spent at library

56: OTHER EDUCATION
At day care/nursery before or after school only

Other education-related activities

59: TRAVEL RELATED TO EDUCATION
Travel directly from home to school

Travel directly from school to home

Other school-related travel; waited for related travel; travel to school not originating from home

Travel to library

60-69: Organizational Activities

60: WORK FOR PROFESSIONAL/UNION ORGANIZATIONS
Meetings of professional/union groups

Other activities, professional/union group including social activities and meals

61: WORK FOR SPECIAL INTEREST IDENTITY ORGANIZATIONS
Includes groups based on sex, race, national origin; NOW, NAACP, Polish-American Society, neighborhood, block organizations, CR groups, senior citizens, Weight Watchers, etc.

Meetings of identity organization

Other activities, identity organizations and special interest groups, including social activities and meals

62: WORK FOR POLITICAL PARTY AND CIVIC PARTICIPATION
Meetings political/citizen organizations; including city council

Other activities, political/citizen organizations, including social activities, voting, jury duty, helping with election

Hospital volunteer group, United Fund, Red Cross, Big Brother/Sister

Attending meetings of volunteer, helping organizations

Officer work; work as an officer of volunteer/helping organizations

Fund raising activities as a member of volunteer helping organizations, collecting money, planning a collection drive

Direct voluntary help as a member of volunteer group; visiting, bringing food

Other volunteer activities, including social events and meals

64: WORK FOR RELIGIOUS GROUPS
Meetings of religious helping groups; ladies aid circle,missionary society, Knights of Columbus

Other activities of religious helping groups including social activities and meals

Meetings, other church groups; attending meetings of church groups which are not primarily helping oriented or not ascertained if helping oriented

Other activities, other church groups; other activities as a member of church groups which are not helping oriented or not ascertained if helping, including social activities and meals;

Choir practice; bible class

65: RELIGIOUS PRACTICE
Attending services of a church or synagogue, including participating in the service;ushering; singing in the choir leading youth group, going to church, funerals

Individual practice, or religious practice carried out in a small group; praying, meditating, bible study group, visiting graves, Bible reading

66: WORK FOR FRATERNAL ORGANIZATIONS
Moose, VFW, Kiwanis, Lions, Civitan, Chamber of Commerce, Shriners, American Legion

Meetings of fraternal organizations

Other activities as a member of a fraternal organization, including social activities and helping activities and meals

67: WORK FOR CHILD/YOUTH/FAMILY ORGANIZATIONS
Meetings of family/youth/child organizations

Other activities as a member of child/youth/family organizations, including social activities and meals

68: WORK FOR OTHER ORGANIZATIONS
Meetings for team sports (but not playing sports)

Other organizations; any activities as a member of an organization not fitting into above categories; (meetings and other activities included here)

Organizational activity, not ascertained ("At meeting" etc.)

69: TRAVEL RELATED TO ORGANIZATIONAL ACTIVITY
Travel related to organizational activities as a member of a volunteer organization; including travel which is the helping activity, waiting for related travel

Travel related to all other organizational activities; waiting for related travel

70-79: Entertainment/Social Activities

70: SPORTS EVENTS
Watch other people do active leisure activities

Attending sports events

71: MISCELLANEOUS EVENTS
Miscellaneous spectacles, events; circus, fairs, rock concerts, accidents

72: MOVIES
Attending movies

73: ATTENDING THEATRE
Theatre, opera, concert, ballet

74: VISITING MUSEUMS
Visiting museums, zoos, art galleries, exhibitions

75: VISITING
Visiting with others; socializing with people other than R's own HH members either at R's home or another home; talking/chatting in the context of receiving a visit or paying a visit

76: PARTIES
Picnicking

Party, reception, wedding

77: BARS/LOUNGES
Drinking, socializing or hoping to socialize at bar, cocktail lounge

78: OTHER SOCIAL EVENTS
Other events of socializing that do not fit above

79: TRAVEL RELATED TO EVENT/SOCIAL ACTIVITIES
Related travel; waiting for related travel

80-89: Sport and Active Leisure

80: ACTIVE SPORTS
Lessons in sports; swimming, golf, tennis, skating, roller skating

Football, basketball, baseball, volleyball, hockey, soccer, field hockey

Tennis, squash, racquetball, paddleball

Swimming, waterskiing, scuba diving, surfing

Skiing, ice skating, sledding, roller skating

Frisbee, catch

Exercises, weightlifing

Judo, boxing, wrestling

Gymnastics

801:Golf,miniature golf
802:Bowling, pool, ping pong, pinball
803:Yoga

81: OUTDOOR LEISURE
Hunting

Fishing

Boating, sailing, canoeing

Camping, at the beach

Snowmobiling, dune-buggies

Gliding, ballooning, flying

82: WALKING/BIKING
Walking for pleasure

Hiking

Jogging, running

Bicycling

Motorcycling for pleasure

Horseback riding

March in parades

83: HOBBIES
Photography (picture taking)

Collections, scrapbooks

Making movies

84: DOMESTIC CRAFTS
Knitting, needlework, weaving, crocheting (including classes), crewel, embroidery, quilting, quilling, macrame

Sewing

Wrapping gifts,presents

85: ART
Sculpture, painting, potting, drawing

Playing a musical instrument (including practicing), whistling

Singing

Acting (rehearsal for play)

Social and non-social dancing; ballet, modern dance, body movement

Pretend, dress-up

Lessons in music, dance, singing, body movement

Other active leisure

87: GAMES
Playing card games (bridge, poker)

Playing board games (monopoly, Yahtzee, Bingo, Dominoes, Trivial Pursuit)

Playing social games (scavenger hunts), "played games," kind not ascertained

Puzzles

Played with toys

Played indoors (unspecified)

Played computer games, such as Pacman, Kong

88: COMPUTER USE
Using computer - general

Computer use for education

Computer games - adult

Other computer use

89: TRAVEL RELATED TO ACTIVE LEISURE
Related travel, including pleasure drives, rides with family, excursions

90-99:||Passive Leisure

90: RADIO USE
Radio transmitting/CB radio

Listening to radio

91: TV USE
TV viewing

VCR/Home Movies

Cable TV

914:TV and eating

92: RECORDS/TAPES
Recording music

Listening to records, tapes, stereo; listening to music, listening to others playing a musical instrument, editing tapes

93: READ BOOKS
Reading books for pleasure

939: Reading and TV

94: READING MAGAZINES/NOT ASCERTAINED
Reading magazines, reviews, pamphlets

Reading (not ascertained what)

Being read to

95: READING A NEWSPAPER
Reading newspaper

954: Reading newspaper and meals, snacks

96: CONVERSATIONS
Receiving instructions

Being disciplined

Conversations/arguing with HH members

Telephone conversations

97: LETTERS, WRITING, PAPERWORK
Typing letters, bills, forms

Writing letters, literature, poetry, writing a diary

Sending cards

Household paperwork; paying the bills, balancing the checkbook, making lists, getting mail, working on budget

98: OTHER PASSIVE LEISURE
Relaxing

Thinking, planning, reflecting

Doing nothing

Activities of others reported

Smoking cigarettes/pipes/dope (when main activity)

Other passive leisure; pestering, teasing, joking around, messing around, laughing

99: TRAVEL RELATED TO PASSIVE LEISURE
Related travel; waiting for related travel

Appendix B

Complete CATI Questionnaire

B1. ADULT QUESTIONS

```
**********ARB ADULT INSTRUMENT - SUBSTANTIVE QUESTIONS**********

DESCRIPTION OF RESIDENCE, OCCUPATION, SMOKING
*********************************************

>Tim1< [allow 4][equiv hhat position 6]
>stm1< [settime Tim1]


>hous<  To begin, would you describe the building you live in as:

        (READ CATEGORIES)

        <1> A separate single-family house,
        <2> A single-family home attached to other dwellings,
        <3> An apartment building,
        <4> A mobile home or trailer, or
        <5> Something else?(SPECIFY)[specify]
        [##lab Describe building you live in
        --->


>hsnm<  [allow 27][equiv anam position 13]

>st<    [if tim1 is <>]        ** added 10/19 **
            [settime tim1]
            [endif]
        [settime Tim1]
        [if hous eq <1>][store <your house> in hsnm][goto park][else]
        [if hous eq <2>][store <the building you live in> in hsnm][goto park]
        [else]
        [if hous eq <3>][store <your apartment building> in hsnm][goto park]
        [else]
        [if hous eq <4>][store <your mobile home or trailer> in hsnm][goto park]
        [else]
        [if hous eq <5>][store <the building you live in> in hsnm][goto park]
        [endif][endif][endif][endif][endif]

>park<  Does [fill hsnm] have an attached garage
        or a parking area underneath it?[indirect]
                                                    [equiv hous position 2]

                <1> Yes[goto prk2]
                <5> No, neither

                <8> DK
                <9> RF
[##lab Attached garage or parking under
                --->[goto wkjb]

>prk2<  While you were at home yesterday, were ANY cars, trucks, motorcycles,
        or other motor vehicles parked in the attached garage (or
```

under-building parking area)?[indirect]

<1> Yes (FOR ANY PART OF THE DAY)
<5> No

<8> DK
<9> RF

[##lab Any mv in garage/parking yesterday
===>

>wkjb< Now I have a few questions about what you do.

Are you currently working, unemployed and looking for work, on layoff from a job, retired, going to school, keeping house, or something else?

<1> Working[goto wkhr]
<2> Looking for work
<3> On layoff from work
<4> Retired
<5> Going to school
<6> Keeping house
<7> Something else (SPECIFY)[specify]

<8> DK
<9> RF

[##lab Labor force status
===>[goto smok]

>wkhr< How many hours a week do you work at a paid job?[indirect]

<1-100> Number of hours

<777> (CODE AFTER PROBE ONLY) Variable number of hours per week[goto vwhr]

<888> DK
<999> RF

[##lab Hours per week at paid job][##md2 888]
===>[goto occ]

>vwhr< How many hours have you worked at a paid job in the past seven days? (From a week ago today through the end of yesterday)[indirect]

<1-100> Number of hours

<888> DK
<999> RF

[##lab Hours worked in past 7 days][##md2 888]
===>

>occ< What is your occupation, that is, what do you do? [allow 2]

(PROBE AS NEEDED: What is your job title? What kind of business or industry do you work in?)

(IF R HAS MORE THAN ONE JOB, ENTER "MAIN" JOB FIRST AND THEN ENTER SECOND JOB(S))
[##lab Occupation summary code
---> [specify]

>Aoin< [allow 6] [##lab extra space for misc recoding]

>njob< INTERVIEWER CODE WITHOUT ASKING UNLESS UNCLEAR:
[indirect]
Number of jobs reported:

<1> One job

<2-5> Number of jobs
<7> More than five jobs [##[6+]

<8> DK
<9> RF
[##lab Number of jobs R works
--->

>wkhr< [if wkhr gt <10>][goto wp1][else]
[if wkhr le <10>][goto smok][endif][endif]

>wp1< Does your job involve working on a regular basis, that is, once a week or more often, with:
[loc 2/8]
Gas stoves or ovens?[##lab Work w/gas stoves, ovens
<1> Yes <5> No --->
>wp2< Open flames?[no erase][##lab Work w/open flames
<1> Yes <5> No --->
>wp3< Solvents or chemicals?[no erase][##lab Work w/solvent, chemicals
<1> Yes(SPECIFY)[specify] <5> No --->
>wp4< Dust or particles of any sort?[no erase][##lab Work w/dust, any particles
<1> Yes <5> No --->
>wp5< Gasoline or diesel-powered vehicles or work equipment?[no erase][##lab Work w/gas, diesel vehicles, equip
<1> Yes <5> No --->
>wp6< Other air pollutants?[no erase][##lab Work w/other air pollutants
<1> Yes(SPECIFY)[specify] <5> No --->

>smok< Did you smoke any cigarettes yesterday -- even one?

(IF R SAYS "I don't smoke," CODE 5 (No) TO smok AND smk2 BUT DON'T ASK smk2.)

<1> Yes[goto smky]
<5> No

<8> DK
<9> RF
[##lab Smoke cigarettes yesterday
===>[goto smk2]

>smky< Roughly, how many cigarettes did you smoke yesterday?

<1-100> Number of cigarettes smoked yesterday
<888> DK
<999> RF
[##lab How many cigtts smoked yesterday][##md2 888]
===>

>smk2< (CODE OR ASK AS NEEDED)
Did you smoke any cigars or pipe tobacco yesterday?

<1> Yes[goto smy2]
<5> No

<8> DK
<9> RF
[##lab Smoke cigars or pipe tobacco yesterday
===>[goto clc3]

>smv2< Roughly how many cigars or pipes of tobacco
did you smoke yesterday?

<1-100> Number of cigars or pipefuls of tobacco smoked yesterday

<888> DK
<999> RF
[##lab How many cigars/pipes smoke ystrdy][##md2 888]
===>

>Tim2< [allow 4]

>clc3< [if clc6 is <> goto clc5] ** automatically branch first time **

>clc4< INTERVIEWER: Do you want to branch to the adult time use diary?

<1> Yes, branch to the adult diary [goto clc5]

<5> No, bypass the adult diary [goto pgar]

[##lab Interviewer check point

IF NECESSARY, USE :ca TO ENTER YOUR CHOICE.
--->

>clc5< [settime Tim2]
[store <2> in cp04]
[call com5] ** branch to diary instrument **

>clc6< INTERVIEWER: Describe the condition of the adult diary, as YOU left it:

<1> all diary questions asked

<3> diary questions started, but not completed
[##lab Interviewer check point

NOTE: ALWAYS ANSWER THIS ITEM - DO NOT USE THE :sk cb COMMAND HERE.
--->

>Tim3< [allow 4]
>m3< [settime Tim3]
[store <5> in clc4]

POLLUTANTS EXPOSURES
****

>pgar< Just to be sure we didn't miss any important information, I have some additional questions about yesterday's activities.
Did you spend ANY time yesterday at a gas station or in a parking garage or auto repair shop?

<1> Yes[goto pgys]
<5> No

<8> DK
<9> RF
[##lab At station, parking, auto shop ystrday
---> [goto gstv]

>pgys< About how long in all yesterday did you spend in those places?
[indirect]
<1-840> record number of minutes

<841> more than 14 hours

<888> DK

<999> RF
[##lab Total minutes in pgar places ystrdy][##md2 888]
===>

>pgas< Did you pump or pour any gasoline (yesterday)?
[indirect]
<1> Yes
<5> No

<7> (VOLUNTEERED RESPONSE) Someone else pumped or poured gas, but R was there

<8> DK
<9> RF
[##lab Pump/pour any gasoline ystrday
===>

>gstv< Did you spend any part of yesterday in a room where a a gas range or oven was turned on?

<1> Yes[goto nstv]
<5> No

<8> DK
<9> RF
[##lab In room w/gas oven on ystrdy
===>[goto htys]

>nstv< Were you around more than one gas range or oven yesterday, or only one?
[indirect]
<1> Only one [goto gspr]
<5> More than one[goto ms1]

<8> DK
<9> RF
[##lab Around how many gas ovens ystrdy
===>[goto htys]

>ms1< Was the gas range or oven you were around for the longest time yesterday being used for cooking, for heating the room, or for some other purpose?[indirect]

<1> Cooking
<3> Heating the room
<5> (PROBE ONCE FIRST) Both cooking and heating the room

<7> Some other purpose (SPECIFY)[specify]

<8> DK
<9> RF
[##lab Oven on ystrday for cook, heat, othr
===>

```
>mstm<  Roughly how many minutes or hours IN ALL were you in rooms
        where gas ranges or ovens were turned on (yesterday)?[indirect]

        <1-840> record number of minutes
        <841>     more than 14 hours

        <888>     DK
        <999>     RF
[##lab Total minutes w/ on ovens ystrdy][##md2 888]
        --->

>ms2<   Does the oven or range that you were around the longest
        have a gas pilot light or
        pilotless ignition?[indirect]

        <1> Gas pilot

        <3> (VOLUNTEERED RESPONSE ONLY) Light with matches or sparker

        <5> Pilotless ignition (makes click-click-click sound)

        <7> Other (SPECIFY)[specify]

        <8> DK
        <9> RF
[##lab Oven have gas pilot light, other
        --->[goto htys]

>gspr<  Was the gas range or oven being used for cooking, for heating the room,
        or for some other purpose?[indirect]

        <1> Cooking
        <3> Heating the room
        <5> (PROBE ONCE FIRST) Both cooking and heating the room
        <7> Some other purpose (SPECIFY)[specify]

        <8> DK
        <9> RF
[##lab Oven on ystrday for cook, heat, other
        --->

>gstm<  Roughly how many minutes or hours (in all) were you in a room
        where a gas range or oven was turned on (yesterday)?[indirect]

        <1-840> record number of minutes
        <841>     more than 14 hours

        <888>     DK
        <999>     RF
[##lab Total minutes w/ on oven ystrdy][##md2 888]
        --->

>plot<  Does the oven or range have a gas pilot light or
```

pilotless ignition?[indirect]

<1> Gas pilot

<3> (VOLUNTEERED RESPONSE ONLY) Light with matches or sparker

<5> Pilotless ignition (makes click-click-click sound)

<7> Other (SPECIFY)[specify]

<8> DK
<9> RF
[##lab Oven have gas pilot light, other
===>

>htys< Was the heat turned on at any time in your home yesterday?

<1> Yes[goto htfl]
<5> No

<8> DK
<9> RF
[##lab Heat on in your home ystrdy
===>[goto open]

>htfl< What kind of heat was it -- gas, electricity, oil, or what?
(IF COMBINATION: Which kind did you use most?[indirect]

<1> Gas
<2> Electricity
<3> Fuel oil or kerosene
<4> Wood
<5> Coal or coke
<6> Solar energy
<7> Other (SPECIFY)[specify]

<8> DK
<9> RF
[##lab Kind of heat on ystrdy
===>

>heat< What type of heater was turned on for the longest amount of time?
Was it a wall furnace, a floor furnace, forced air, radiator,
space heater, or something else?
[indirect]
<1> Wall furnace
<2> Floor furnace
<3> Forced air
<4> Radiator
<5> Wood stove
<6> Fireplace

```
        <7> Gravity heater
        <8> Space heater
        <9> Something else (SPECIFY) [specify]

        <88> DK
        <99> RF
[##lab Type of heater on longest ystrdy][##md2 88]
        --->

>open<  Were any doors or windows in your home open for more than a
        minute or two at a time yesterday?

        <1> Yes[goto opn1]
        <5> No

        <7> (VOLUNTEERED)YES - HAVE A WINDOW OPEN ALL THE TIME[goto arst]

        <8> DK
        <9> RF
[##lab Doors/windows in home open ystrdy
        --->[goto fan1]

>arst<  [if open eq <7>][store <720> in opn1][store <720> in opn2]
        [goto fan1][endif]

>opn1<  For about how long during the day, that is, from 6am to 6pm,
        (were they/was it) open?[indirect]

        <1-720> # of minutes

        <0>  Not open between 6am and 6pm

        <888> DK
        <999> RF
[##lab  Mins door/window open ystrdy 6am-6pm][##md2 888]
        --->

>opn2<  For about how long during evening or night hours, that is, from 6pm
        to 6am, (were they/was it) open?[indirect]

        <1-720> # of minutes

        <0>  Not open between 6pm and 6am

        <888> DK
        <999> RF
[##lab Mins door/window open ystrdy 6pm-6am][##md2 888]
        --->

>fan1<  Did you use any kind of fan in your home yesterday?


        <1> Yes[goto fan2]
        <5> No
```

<8> DK
<9> RF
[##lab Use a fan in home ystrdy
===>[goto airc]

>fan2< Was that a ceiling fan, window fan, portable room fan, or something else?[indirect]

<1> ceiling fan
<2> window fan
<3> portable room fan

<4> (VOLUNTEERED RESPONSE) exhaust fan in bathroom or kitchen

<5> something else (specify) [specify]

<8> DK
<9> RF
[##lab Type of fan used in home ystrdy
===>

>airc< (Other than the fan you just mentioned)
Did you use any kind of air cooling system in your home yesterday, such as an air conditioner?

<1> Yes[goto ACtp]
<5> No

<8> DK
<9> RF
[##lab Use air-cooling system in home ystrdy
===>[goto glue]

>ACtp< What type is it?[indirect]

<1> Evaporative cooler (swamp cooler)
<5> Refrigeration type (air conditioner)

<7> Other (SPECIFY)[specify]

<8> DK - Have air conditioning but don't know what kind
<9> RF
[##lab Type of air-cool sys used in home ystrdy
===>

>glue< Did you use or were you around anyone while they were using any of the following yesterday:

Any glues or liquid or spray adhesives?
(NOT INCLUDING ADHESIVE TAPE)

<1> Yes
<5> No

<8> DK
<9> RF
[##lab Use/near glues, other adhesives ystrdy
---->

>pnt1< (Did you use or were you around anyone while they were using:)

Any oil-based paint products (yesterday)?

<1> Yes
<5> No

<7> (VOLUNTEERED RESPONSE ONLY) Was around paint but don't know what kind[goto solv]

<8> DK
<9> RF
[##lab Use/near oil-based paint products ystrdy
---->

>pnt2< (Did you use or were you around anyone while they were using:)

Any water-based paint products (yesterday)?

(ALSO KNOWN AS "LATEX PAINT")

<1> Yes
<5> No

<8> DK
<9> RF
[##lab Use/near water-based paint prods ystrdy
---->

>solv< (Did you use or were you around anyone while they were using:)

Any solvents (yesterday)?

<1> Yes
<5> No

<8> DK
<9> RF
[##lab Use/near any solvents ystrdy
---->

>pest< (Did you use or were you around anyone while they were using:)

Any pesticides (yesterday) such as bug strips or bug sprays?

<1> Yes [goto pst2]
<5> No

<8> DK
<9> RF

[##lab Use/near any pesticides ystrdy
===>[goto soap]

>pst2< When you were around pesticides yesterday, were you mostly indoors or outdoors?[indirect]

<1> Indoors
<5> Outdoors

<7> (CODE ONLY AFTER PROBE) Both indoors and outdoors equally

<8> DK
<9> RF

[##lab Pesticides indoors or outdoors ystrdy
===>

>soap< (Did you use or were you around anyone while they were using:)

Any soaps or detergents (yesterday)?

<1> Yes
<5> No

<8> DK
<9> RF

[##lab Use/near soaps, detergents ystrdy
===>

>Ocln< (Did you use or were you around anyone while they were using:)

Any other household cleaning agents such as Ajax or ammonia (yesterday)?

<1> Yes
<5> No

<8> DK
<9> RF

[##lab Use/near HH cleaning agents ystrdy
===>

>aero< Yesterday, did you use any personal care aerosol spray products such as deodorants or hair spray or were you in a room while they were being used?

<1> Yes
<5> No

<8> DK
<9> RF

[##lab Use/near personal care aerosols ystrdy
---->

>shwr< Did you take a hot shower yesterday?

<1> Yes
<5> No

<8> DK
<9> RF
[##lab Take a hot shower ystrdy
---->

>bath< Did you take a hot bath or use an indoor hot tub yesterday?

<1> Yes
<5> No

<8> DK
<9> RF
[##lab Hot bath or indoor hot tub ystrdy
---->

>moth< Are you currently using any of the following in your home:

Any mothballs, or moth crystals or cakes?

<1> Yes
<5> No

<8> DK
<9> RF
[##lab Now use moth balls/crystals/cakes in home
---->

>deod< Any toilet bowl deodorizers?

<1> Yes
<5> No

<8> DK
<9> RF
[##lab Now use toilet bowl deodorizers in home
---->

>rmfr< Any SCENTED room fresheners?

<1> Yes
<5> No

<8> DK
<9> RF
[##lab Now use scented room freshners in home
---->

>age< Now I have a few background questions about you, to be sure we talk to people from all walks of life.

How old were you on your last birthday?

[loc 3/8]

<18-96> Exact age
<97> 97 or older

<98> Don't know
<99> Refused

[##lab Adult respondent's age in years
===>

>educ< What was the last grade or year in school you COMPLETED?

<00-08> less than high school

<09-11> some high school

<12> high school graduate (also GED)

<13-15> some college

<16> college graduate (also BA, BS, or other bachelor's degree)

<17> graduate school[goto gdgr]

<88> DK
<99> RF

[##lab Adult R years of education][##md2 88]
===>[goto mrtl]

>gdgr< Have you received a master's degree, doctorate, or some other advanced degree?[indirect]

<1> No - no advanced degree

<2> Master's degree - MA, MS, MSW, MBA, MFA

<3> Doctorate or other advanced degree - PhD, MD, JD, EdD, DSc

<4> Other (SPECIFY) [specify]

[##lab Adult have adv/grad degree
===>

>mrtl< Are you now married, living with someone in a marriage-like relationship, widowed, divorced, separated, or have you never been married?

<1> Married and living with spouse (or spouse in military)
<2> Living in a marriage-like relationship

<3> Widowed
<4> Separated
<5> Divorced
<6> Never married

<8> Don't know
<9> Refused
[##lab Adult R's marital status
---->

>zip< What is the postal ZIP code for your home address?

<90000-99999>

<x> Other
<8> DK
<9> RF
[##lab Zip code for R's home address
---->

>cnty< What county do you live in? (ASK R TO SPELL IF UNCLEAR)

<1> Alameda	<15> Kern	<29> Nevada	<43> Santa Clara
<2> Alpine	<16> Kings	<30> Orange	<44> Santa Cruz
<3> Amador	<17> Lake	<31> Placer	<45> Shasta
<4> Butte	<18> Lassen	<32> Plumas	<46> Sierra
<5> Calaveras	<19> Los Angeles	<33> Riverside	<47> Siskiyou
<6> Colusa	<20> Madera	<34> Sacramento	<48> Solano
<7> Contra Costa	<21> Marin	<35> San Benito	<49> Sonoma
<8> Del Norte	<22> Mariposa	<36> SanBernardino	<50> Stanislaus
<9> El Dorado	<23> Mendocino	<37> San Diego	<51> Sutter
<10> Fresno	<24> Merced	<38> SanFrancisco	<52> Tehama
<11> Glenn	<25> Modoc	<39> San Joaquin	<53> Trinity
<12> Humboldt	<26> Mono	<40> SanLuisObispo	<54> Tulare
<13> Imperial	<27> Monterey	<41> San Mateo	<55> Tuolomne
<14> Inyo	<28> Napa	<42> SantaBarbara	<56> Ventura
			<57> Yolo
<88> DK	<99> RF		<58> Yuba

[##lab County R lives in][##md2 88]
---->

>area< Would you say the area you live in is:

(READ CATEGORIES)[##et]

<1> rural,
<3> suburban, or
<5> a city?
[##bt](IF R SAYS "small town"; PROBE: Is it within 25 miles of[##et]
[##bt]a city? WITHIN 25 MILES, CODE AS SUBURBAN; FARTHER AWAY[##et]
[##bt]CODE AS RURAL)[##et]

<8> DK
<9> RF

[##lab Environs of R's home
---->

>HHT< How many people who are 12 to 17 years old live in your household?

IF UNCLEAR: I'm refering to the household in which the telephone number [fill pnm2:0]-[fill pnm3:0] is located.
[##bla 99] [allow 5]

<0> No one age 12 to 17 lives in the household

<1-10> One to ten (ENTER EXACT NUMBER)

<11> More than ten

<98> Don't know
<99> Refused

[##lab Number of 12-17 yr olds in HH
---->

>bg15< How many telephones, counting extensions, do you have in your home?

<1> One [goto SY15]
<5> Two or more

<8> Don't know, not sure [goto EOY]
<9> Refused [goto EOY]

[##lab Count of telephone sets in HH
---->

>bg16< Do (both/all) the telephones have the same number?[indirect]

<1> Yes [goto SY15]
<5> No [goto bg17]

<8> Don't know, not sure
<9> Refused

[##lab Do all phones have same number
----> [goto EOY]

>bg17< How many different numbers are there?[indirect]
[no erase]

<2-25> ENTER NUMBER

<98> Don't know, not sure
<99> Refused

[##lab Count of diff tel numbers in HH

----> [goto EOY]

```
>SY15<    [store <1> in bg17]

>EOY<     [allow 1][end]

>rsex<   INTERVIEWER CODE SEX OF RESPONDENT:
         RESPONDENT'S NAME IS "[fill anam]"

         (ASK ONLY IF ABSOLUTELY UNSURE: Are you male or female?

         <1> Male
         <5> Female
[##lab Adult R sex
         ===>

>incm<   Think of the income BEFORE TAXES of ALL MEMBERS of your
         household living with you in 1987, and include income from all
         sources including wages, pensions, dividends, interest,
         and all other income.

         Was the total income from all sources, (including your own,)
         under or over $30,000?

         (IF UNCERTAIN: What would be your best guess?)

                <1> Under $30,000     [goto incE]
                <3> Exactly $30,000
                <5> Over $30,000      [goto incA]

                <8> DK
                <9> RF
[##lab See ISUM for HH income summary
         ===>[goto tin1]

>incA<   Was it under or over $40,000?

         (IF UNCERTAIN: What would be your best guess?)

                <1> Under $40,000
                <3> Exactly $40,000
                <5> Over $40,000[goto incB]

                <8> DK
                <9> RF
[##lab See ISUM for HH income summary
         ===>[goto tin1]

>incB<   Was it under or over $50,000?

         (IF UNCERTAIN: What would be your best guess?)

                <1> Under $50,000
```

```
                <3> Exactly $50,000
                <5> Over $50,000[goto incC]

                <8> DK
                <9> RF
[##lab See ISUM for HH income summary
        --->[goto tin1]

>incC< Was it under or over $60,000?

        (IF UNCERTAIN: What would be your best guess?)

                <1> Under $60,000
                <3> Exactly $60,000
                <5> Over $60,000[goto incD]

                <8> DK
                <9> RF
[##lab See ISUM for HH income summary
        --->[goto tin1]

>incD< Was it under or over $70,000?

        (IF UNCERTAIN: What would be your best guess?)

                <1> Under $70,000
                <3> Exactly $70,000
                <5> Over $70,000

                <8> DK
                <9> RF
[##lab See ISUM for HH income summary
        --->[goto tin1]

>incE< Was it under or over $20,000?

        (IF UNCERTAIN: What would be your best guess?)

                <1> Under $20,000[goto incF]
                <3> Exactly $20,000
                <5> Over $20,000

                <8> DK
                <9> RF
[##lab See ISUM for HH income summary
        --->[goto tin1]

>incF< Was it under or over $10,000?

        (IF UNCERTAIN: What would be your best guess?)

                <1> Under $10,000
                <3> Exactly $10,000
                <5> Over $10,000
```

```
                <8> DK
                <9> RF
[##lab See ISUM for HH income summary
        --->[goto tin1]


>ISUM<  [allow 2]  [##lab Income series summary variable]

>tin1<  [if incm eq <8>][store <88> in ISUM][goto stm4][endif][#Don't know
        [if incm eq <9>][store <99> in ISUM][goto stm4][endif][#Refused
        [if incF eq <8>][store <81> in ISUM][goto stm4][endif][#DK - lt 20K
        [if incF eq <9>][store <91> in ISUM][goto stm4][endif][#RF - lt 20K
        [if incE eq <8>][store <82> in ISUM][goto stm4][endif][#DK - lt 30K
        [if incE eq <9>][store <92> in ISUM][goto stm4][endif][#RF - lt 30K
        [if incA eq <8>][store <83> in ISUM][goto stm4][endif][#DK - gt 30K
        [if incA eq <9>][store <93> in ISUM][goto stm4][endif][#RF - gt 30K
        [if incB eq <8>][store <84> in ISUM][goto stm4][endif][#DK - gt 40K
        [if incB eq <9>][store <94> in ISUM][goto stm4][endif][#RF - gt 40K
        [if incC eq <8>][store <85> in ISUM][goto stm4][endif][#DK - gt 50K
        [if incC eq <9>][store <95> in ISUM][goto stm4][endif][#RF - gt 50K
        [if incD eq <8>][store <86> in ISUM][goto stm4][endif][#DK - gt 60K
        [if incD eq <9>][store <96> in ISUM][goto stm4][endif][#RF - gt 60K

   n2<  [if incF eq <1>][store <01> in ISUM][goto stm4][endif][#Under   10K
        [if incF eq <3>][store <02> in ISUM][goto stm4][endif][#Exactly 10K
        [if incF eq <5>][store <03> in ISUM][goto stm4][endif][#gt10-lt 20K
        [if incE eq <3>][store <04> in ISUM][goto stm4][endif][#Exactly 20K
        [if incE eq <5>][store <05> in ISUM][goto stm4][endif][#gt20-lt 30K
        [if incm eq <3>][store <06> in ISUM][goto stm4][endif][#Exactly 30K
        [if incA eq <1>][store <07> in ISUM][goto stm4][endif][#gt30-lt 40K
        [if incA eq <3>][store <08> in ISUM][goto stm4][endif][#Exactly 40K
        [if incB eq <1>][store <09> in ISUM][goto stm4][endif][#gt40-lt 50K
        [if incB eq <3>][store <10> in ISUM][goto stm4][endif][#Exactly 50K
        [if incC eq <1>][store <11> in ISUM][goto stm4][endif][#gt50-lt 60K
        [if incC eq <3>][store <12> in ISUM][goto stm4][endif][#Exactly 60K
        [if incD eq <1>][store <13> in ISUM][goto stm4][endif][#gt60-lt 70K
        [if incD eq <3>][store <14> in ISUM][goto stm4][endif][#Exactly 70K
        [if incD eq <5>][store <15> in ISUM][goto stm4][endif][#Over    70K


>Tim4<  [allow 4]
>stm4<  [settime Tim4]
```

B2. YOUTH QUESTIONS

**********YOUTH INSTRUMENT - SUBSTANTIVE QUESTIONS**********

OCCUPATION, STUDENT, SMOKING
****

>ytjb< First, I have a few questions about what you do.
Are you currently working at a paid job?

<1> Yes [goto ywhr]
<5> No [goto ystu]

<8> DK
<9> RF
[##lab Youth R labor force status
--->[goto ystu]

>ywhr< How many hours a week do you work at a paid job?

<1-100> Number of hours

<777> (CODE AFTER PROBE ONLY) Variable number of hours per week[goto yvhr]

<888> DK
<999> RF
[##lab Hours work per week (youth R)][##md2 888]
--->

>yvhr< How many hours have you worked at a paid job in the past seven days?
(From a week ago today through the end of yesterday)

<1-100> Number of hours

<0> hasn't worked at all in the past seven days

<888> DK
<999> RF
[##lab Hours worked in past 7 days][##md2 888]
--->

>yocc< What is your occupation, that is, what do you do? [allow 2]
(PROBE AS NEEDED: What is your job title? What kind of business
or industry do you work in?)

(IF R HAS MORE THAN ONE JOB, ENTER "MAIN" JOB FIRST AND THEN
ENTER SECOND JOB(S))
[##lab Youth R occupation summary
---> [specify]

>Yoin< [allow 6] [##lab space for misc recoding]

>ynjb< INTERVIEWER CODE WITHOUT ASKING UNLESS UNCLEAR:

Number of jobs reported:

<1> One job

<2-5> Number of jobs
<7> More than five jobs

<8> DK
<9> RF
[##lab Number jobs youth R works
===>

>ytwr< [if ywhr gt <10>][goto ywp1][else]
[if ywhr le <10>][goto ystu][endif][endif]

>ywp1< Does your job involve working on a regular basis,
that is, once a week or more often, with:
[loc 4/8]
Gas stoves or ovens? [##lab Work w/gas stoves, ovens
<1> Yes <5> No ===>
>ywp2< Open flames?[no erase][##lab Work w/ open flames
<1> Yes <5> No ===>
>ywp3< Solvents or chemicals?[no erase][##lab Work w/ solvents, chemicals
<1> Yes(SPECIFY)[specify] <5> No ===>
>ywp4< Dust or particles of any sort?[no erase][##lab Work w/ dust, any particl
<1> Yes <5> No ===>
>ywp5< Gasoline or diesel-powered vehicles or work
equipment?[no erase][##lab Work w/ gas, diesel mv or equip
<1> Yes <5> No ===>
>ywp6< Other air pollutants?[no erase][##lab Work w/ other air pollutants
<1> Yes(SPECIFY)[specify] <5> No ===>

>ystu< Are you currently in school?

<1> Yes
<5> No

<8> DK
<9> RF
[##lab Currently in school (youth R)
===>

>ysmk< Did you smoke any cigarettes yesterday -- even one?

(IF R SAYS "I don't smoke," CODE 5 (No) TO ysmk AND ysm2 BUT
DON'T ASK ysm2.)

<1> Yes[goto ysmy]
<5> No

<8> DK
<9> RF
[##lab Youth R smoke cigs ystrdy
===>[goto ysm2]

>ysmy< Roughly, how many cigarettes did you smoke yesterday?

<1-100> Number of cigarettes smoked yesterday

<999> DK/Refused
[##lab Count of cigtts smoked ystrday
===>

>ysm2< (CODE OR ASK AS NEEDED)
Did you smoke any cigars or pipe tobacco yesterday?

<1> Yes[goto ysy2]
<5> No

<8> DK
<9> RF
[##lab Smoke cigars/pipes ystrdy (youth R)
===>[goto ycc5]

>ysy2< Roughly how many cigars or pipes of tobacco
did you smoke yesterday?

<1-100> Number of cigars or pipefuls of tobacco smoked yesterday

<999> DK/Refused
[##lab Count of cigars/pipes smoked ystrdy
===>

>ycc5< [if ycc8 is <> goto ycc7] ** automatically branch first time **

>ycc6< INTERVIEWER: Do you want to branch to the youth time diary?

<1> Yes, take me into the youth diary [goto ycc7]

<5> No, bypass the youth diary [goto ypgr]

[##lab Interviewer checkpoint
IF NECESSARY, USE :ca TO ENTER YOUR CHOICE
===>

>ycc7< [store <3> in cp04]
[call com5] ** branch to diary instrument **

>ycc8< INTERVIEWER: Describe condition of the youth diary, as YOU left it:

<1> all diary questions asked

<3> diary questions started, but not completed

[##lab Interviewer checkpoint
NOTE: ALWAYS ANSWER THIS ITEM - DON'T USE THE :sk cb COMMAND HERE.
--->

>ycc9< [store <5> in ycc6]

OTHER POLLUTANTS; DEMOGRAPHICS
****

>ygr< Just to be sure we didn't miss any important information, I have some additional questions about yesterday's activities.
Did you spend ANY time yesterday at a gas station or in a parking garage or auto repair shop?

<1> Yes[goto ypgy]
<5> No

<8> DK
<9> RF
[##lab Gas station, garage, shop ystrdy
---> [goto ystv]

>ypgy< About how long in all yesterday did you spend in those places?

<1-840> record number of minutes
<841> more than 14 hours

<888> DK [goto ystv]
<999> RF [goto ystv]
[##lab Minutes in ypgr places ystrdy][##md2 888]
--->

>ypgs< Did you pump or pour any gasoline (yesterday)?

<1> Yes
<5> No

<5> Someone else pumped or poured the gas,

but R was there(VOLUNTEERED RESPONSE)

<8> DK
<9> RF
[##lab Pump/pour gasoline ystrday
===>

>ystv< Did you spend any part of yesterday in a room where a
a gas range or oven was turned on?

<1> Yes[goto ynst]
<5> No

<8> DK
<9> RF
[##lab In room w/ on gas oven ystrdy
===>[goto yglu]

>ynst< Were you around more than one gas range or oven yesterday, or only one?

<1> Only one [goto ygsp]
<5> More than one[goto ymsl]

<8> DK
<9> RF
[##lab How many gas ovens around ystrdy
===>[goto yglu]

>ymsl< Was the gas range or oven you were around for the longest time
yesterday being used for cooking, for heating the room,
or for some other purpose?[indirect]

<1> Cooking
<3> Heating the room
<5> (PROBE ONCE FIRST) Both cooking and heating the room

<7> Some other purpose (SPECIFY)[specify]

<8> DK
<9> RF
[##lab Oven used for cook, heat ystrdy
===>

>ymsm< Roughly how many minutes or hours (in all) were you in rooms
where gas ranges or ovens were turned on (yesterday)?[indirect]

<1-840> record number of minutes
<841> more than 14 hours

<888> DK
<999> RF
[##lab Mins w/ on ovens ystrdy][##md2 888]
===>

>yms2< Does the oven or range that you were around the longest have a gas pilot light or pilotless ignition?[indirect]

<1> Gas pilot

<3> (VOLUNTEERED RESPONSE ONLY) Light with matches or sparker

<5> Pilotless ignition (makes click-click-click sound)

<7> Other (SPECIFY)[specify]

<8> DK
<9> RF

[##lab Oven have gas pilot light, other
---->[goto yglu]

>ygsp< Was the gas range or oven being used for cooking, for heating the room, or for some other purpose?[indirect]

<1> Cooking
<3> Heating the room
<5> (PROBE ONCE FIRST) Both cooking and heating the room
<7> Some other purpose (SPECIFY)[specify]

<8> DK
<9> RF

[##lab Use oven for cook, heat ystrdy
---->

>ygtm< Roughly how many minutes or hours (in all) were you in a room where a gas range or oven was turned on (yesterday)?[indirect]

<1-840> record number of minutes
<841> more than 14 hours

<888> DK
<999> RF

[##lab Mins in room w/ on oven ystrdy][##md2 888]
---->

>yplt< Does the oven or range have a gas pilot light or pilotless ignition?[indirect]

<1> Gas pilot

<3> (VOLUNTEERED RESPONSE ONLY) Light with matches or sparker

<5> Pilotless ignition (makes click-click-click sound)

<7> Other (SPECIFY)[specify]

<8> DK
<9> RF
[##lab Oven have gas pilot light, other
===>

>yglu< Did you use or were you around anyone who was using any of the following yesterday:

Any glues or liquid or spray adhesives (NOT INCLUDING ADHESIVE TAPE)?

<1> Yes
<5> No

<8> DK
<9> RF
[##lab Use/near glues, adhesives ystrdy
===>

>ypt1< (Did you use or were you around anyone while they were using:)

Any oil-based paint products (yesterday)?

<1> Yes
<5> No

<5> Was around paint but don't know what kind[goto yslv]
(VOLUNTEERED RESPONSE ONLY)

<8> DK
<9> RF
[##lab Use/near oil-based paint ystrdy
===>

>ypt2< (Did you use or were you around anyone while they were using:)

Any water-based paint products (yesterday)?
(ALSO KNOWN AS 'LATEX' PAINT)

<1> Yes
<5> No

<8> DK
<9> RF
[##lab Use/near water-based paint ystrdy
===>

>yslv< (Did you use or were you around anyone while they were using:)

Any solvents (yesterday)?

<1> Yes

<5> No

<8> DK
<9> RF
[##lab Use/near any solvents ystrdy
===>

>ypst< (Did you use or were you around anyone while they were using:)

Any pesticides (yesterday) such as bug strips or bug sprays?

<1> Yes[goto yps2]
<5> No

<8> DK
<9> RF
[##lab Use/near pesticides ystrdy
===>[goto ysp]

>yps2< While you were around pesticides yesterday, were you mostly indoors or outdoors?

<1> indoors
<5> outdoors

<7> (CODE ONLY AFTER PROBE) Both indoors and outdoors equally

<8> DK
<9> RF
[##lab Pesticides indoors or outdoors
===>

>ysp< (Did you use or were you around anyone while they were using:)

Any soaps or detergents (yesterday)?

<1> Yes
<5> No

<8> DK
<9> RF
[##lab Use/near soap, detergents ystrdy
===>

>ycln< (Did you use or were you around anyone while they were using:)

Any other household cleaning agents such as Ajax or ammonia (yesterday)?

<1> Yes
<5> No

<8> DK
<9> RF

[##lab Use/near HH cleaning agents ystrdy
---->

>yaro< Yesterday, did you use any personal care aerosol spray products such as deodorants or hair spray or were you in a room while they were being used?

<1> Yes
<5> No

<8> DK
<9> RF

[##lab Use/near personal aerosols ystrdy
---->

>yshr< Did you take a hot shower yesterday?

<1> Yes
<5> No

<8> DK
<9> RF

[##lab Take hot shower ystrdy
---->

>ybth< Did you take a hot bath or use an indoor hot tub yesterday?

<1> Yes
<5> No

<8> DK
<9> RF

[##lab Hot bath, indoor hot tub ystrdy
---->

>yage< Now I have a few background questions about you, to be sure we talk to people from all walks of life.

How old were you on your last birthday?

<12-17> Exact age

<98> Don't know
<99> Refused

[##lab Youth R age in years
---->

>yedu< What is the last grade in school you have COMPLETED?

<0-6> Elementary grades

<7-8> Junior high grades

<9-11> High school grades

```
        <12>   High school graduate (or GED)

        <13-15> some college
        <16>    college graduate

        <88>    DK
        <99>    RF
[##lab Youth R year of education][##md2 88]
        --->

>ysex<  INTERVIEWER CODE SEX OF YOUTH RESPONDENT:
        YOUTH RESPONDENT'S NAME IS "[fill ynam]"

        (ASK ONLY IF ABSOLUTELY UNSURE:) Are you male or female?

        <1> Male
        <5> Female
[##lab Youth R sex
        --->


>yzzx<  [goto chck]
```

B3. DIARY SECTION

```
>dzid<   [allow 4][loc 0/1]
>zay<    [allow 1][loc 0/5]
>Dcid<   [allow 4][loc 1/1]
         [store dzid in Dcid][open out]
>adyt<   [allow 1][loc 1/5]
         [store zay in adyt]

>car1<   [allow 2][loc 1/79]
>car2<   [allow 2][loc 2/79]
>zCD<    [allow 1][loc 0/19]          ** put item CD outcome on zero for ref **
>zout<   [allow 1][loc 0/20]          ** put item out outcome status on zero **

>date<   [allow 6][loc 2/30]
>dat1<   [setdate date]
>dat2<   [allow 2][equiv date position 1]
>dat3<   [allow 2][equiv date position 3]

>btm1<   [allow 4][loc 2/40]
>stm1<   [settime btm1]

[#setting up the date and month fill for yesterday

>mnnm<   [allow 9][loc 2/45]
>danm<   [allow 14]

>ts1<    [if dat3 ne <01>][goto smon][else][goto dts2][endif]

>dts2<   [if dat2 eq <03>][store <twenty-ninth> in danm][else]
         [if dat2 eq <05>][store <thirtieth> in danm][else]
         [if dat2 eq <07>][store <thirtieth> in danm][else]
         [if dat2 eq <10>][store <thirtieth> in danm][else]
         [if dat2 eq <12>][store <thirtieth> in danm][else]
         [store <thirty-first> in danm]
         [endif] [endif] [endif] [endif] [endif][goto smn2]

>smon<   [if dat2 eq <01>][store <January> in mnnm][goto sday][else]
         [if dat2 eq <02>][store <February> in mnnm][goto sday][else]
         [if dat2 eq <03>][store <March> in mnnm][goto sday][else]
         [if dat2 eq <04>][store <April> in mnnm][goto sday][else]
         [if dat2 eq <05>][store <May> in mnnm][goto sday][else]
         [if dat2 eq <06>][store <June> in mnnm][goto sday][else]
         [if dat2 eq <07>][store <July> in mnnm][goto sday][else]
         [if dat2 eq <08>][store <August> in mnnm][goto sday][else]
         [if dat2 eq <09>][store <September> in mnnm][goto sday][else]
         [if dat2 eq <10>][store <October> in mnnm][goto sday][else]
         [if dat2 eq <11>][store <November> in mnnm][goto sday][else]
         [if dat2 eq <12>][store <December> in mnnm][goto sday][else]
         [endif][endif][endif][endif][endif][endif][endif][endif][endif]
         [endif][endif][endif]

>smn2<   [if dat2 eq <02>][store <January> in mnnm][goto R1][else]
         [if dat2 eq <03>][store <February> in mnnm][goto R1][else]
         [if dat2 eq <04>][store <March> in mnnm][goto R1][else]
         [if dat2 eq <05>][store <April> in mnnm][goto R1][else]
```

```
        [if dat2 eq <06>][store <May> in mnnm][goto R1][else]
        [if dat2 eq <07>][store <June> in mnnm][goto R1][else]
        [if dat2 eq <08>][store <July> in mnnm][goto R1][else]
        [if dat2 eq <09>][store <August> in mnnm][goto R1][else]
        [if dat2 eq <10>][store <September> in mnnm][goto R1][else]
        [if dat2 eq <11>][store <October> in mnnm][goto R1][else]
        [if dat2 eq <12>][store <November> in mnnm][goto R1][else]
        [if dat2 eq <01>][store <December> in mnnm][goto R1][else]
        [endif][endif][endif][endif][endif][endif][endif][endif][endif]
        [endif][endif][endif]

>sday<  [if dat3 eq <02>][store <first> in danm][else]
        [if dat3 eq <03>][store <second> in danm][else]
        [if dat3 eq <04>][store <third> in danm][else]
        [if dat3 eq <05>][store <fourth> in danm][else]
        [if dat3 eq <06>][store <fifth> in danm][else]
        [if dat3 eq <07>][store <sixth> in danm][else]
        [if dat3 eq <08>][store <seventh> in danm][else]
        [if dat3 eq <09>][store <eighth> in danm][else]
        [if dat3 eq <10>][store <ninth> in danm][else]
        [if dat3 eq <11>][store <tenth> in danm][else]
        [if dat3 eq <12>][store <eleventh> in danm][else]
        [if dat3 eq <13>][store <twelfth> in danm][else]
        [if dat3 eq <14>][store <thirteenth> in danm][else]
        [if dat3 eq <15>][store <fourteenth> in danm][else]
        [if dat3 eq <16>][store <fifteenth> in danm][else]
        [if dat3 eq <17>][store <sixteenth> in danm][else]
        [if dat3 eq <18>][store <seventeenth> in danm][else]
        [if dat3 eq <19>][store <eighteenth> in danm][else]
        [if dat3 eq <20>][store <nineteenth> in danm][else]
        [if dat3 eq <21>][store <twentieth> in danm][else]
        [if dat3 eq <22>][store <twenty-first> in danm][else]
        [if dat3 eq <23>][store <twenty-second> in danm][else]
        [if dat3 eq <24>][store <twenty-third> in danm][else]
        [if dat3 eq <25>][store <twenty-fourth> in danm][else]
        [if dat3 eq <26>][store <twenty-fifth> in danm][else]
        [if dat3 eq <27>][store <twenty-sixth> in danm][else]
        [if dat3 eq <28>][store <twenty-seventh> in danm][else]
        [if dat3 eq <29>][store <twenty-eighth> in danm][else]
        [if dat3 eq <30>][store <twenty-ninth> in danm][else]
        [if dat3 eq <31>][store <thirtieth> in danm][else]
        [endif][endif][endif][endif][endif][endif][endif][endif][endif][endif]
        [endif][endif][endif][endif][endif][endif][endif][endif][endif][endif]
        [endif][endif][endif][endif][endif][endif][endif][endif][endif][endif]

                                        ****CREATE "activity" ROSTER****************

>R1<    [roster create activity]

>tbeg<  [allow 4][loc 1/6]   [#time act begins
>tend<  [allow 4][loc 1/10]  [#time act ends
>ETIM<  [allow 4][loc 1/14]  [#elapsed time of act
>TTIM<  [allow 4][loc 1/18]  [#cumulative time total
```

```
        [store <0000> in CTIM]
>ACCD<  [allow 3][loc 1/31]  [#three digit activity code
        [store <000> in ACCD]
>ACT<  [allow 45][loc 1/34]        [#ACT = Name of activity
>actN<  [allow 2][loc 2/5]          [#numerical code for precoded activities-removed Oct. 11
>STA<  [allow 2][loc 2/7]  [# status of entity - DEL or OK
>nck1<  [allow 1][loc 2/9] [# flag for "no" answer to CONT

>R1b<   [roster close]


>PAT1<  [allow 4][loc 2/10]  [#previous activity time store for computations

>ATOT<  [allow 1]                                  [#total of activities reported
        [store <0> in ATOT]

>stxx<  [allow 1]        [# keeps track of whether or not STRT has been answered
>adc1<  [allow 1]                [#checks to see if want to append a new object
>DTO1<  [allow 1]                                     [#Deleted activity counter
>cxx1<  [allow 1]                                   [# Non-completed diary flag


>TRT<  Now, more specifically about how you spent your time YESTERDAY,
       I'd like you to start with midnight, night before last,
       and go through the entire 24 hours ending at midnight last night.
       For each thing you did during that period, I'll
       be asking you to tell me:

               * What you were doing,
               * Where you were, and
               * What time you turned to something else.

       Please tell me about everything you did yesterday in the same order
       that it happened.  There shouldn't be any gaps in time
       between activities.        (WHEN READY, TYPE 1 )

          <1> Start entering diary activities[goto TR21]

          (5) ACTIVITY CODING ONLY [#goto cdst]

       --->

>TR21<   [if Frst eq <> goto RR1]
         [if cxx1 eq <5> goto chg1]

>RR1<    [roster reopen activity]

>R1a<   [if stxx+ eq <x>]
          [if ATOT+ eq <0>]
            [if cxx1+ eq <>]
                [goto tFrs]
            [endif]
          [else]
```

```
          [if ATOT+ gt <0>]
            [if STA ne <>][roster append][endif]
            [goto tFrs]
          [else]
          [if adc1+ eq <x>]
              [if STA ne <>][roster append][endif]
              [goto tFrs]
            [else]
              [goto cls1]
        [endif][endif][endif][endif]
        [store <x> in stxx+]
        [store <> in adc1+]
        [if STA ne <>]
          [roster append]
        [endif]
        [if ATOT+ eq <>]
          [store <0> in ATOT+]
        [endif]

>tFrs<  [if ATOT+ gt <0>][goto nxt1][else]
        [goto Frst][endif]

>Frst<  What were you doing at midnight night before last? [equiv actN]
        (12:00am, the [fill danm+] of [fill mnnm+])

        <0> SOMETHING ELSE - NONE OF THESE BELOW[goto Frs2]

        <1> Working at main job

                <2> Eating a meal or snack

                        <3> Sleeping at night

                                <4> Travelling; in transit

        --->[goto Fact]

>Frs2<  INTERVIEWER ENTER BRIEF DESCRIPTION OF ACTIVITY: [allow 45][equiv ACT]
        (Only 44 characters allowed)

           _____________________________________________
          |                                             |
        ---> [goto whr1]


>nxt1<   [display acts single]What did you do next? [equiv actN]

        <0> SOMETHING ELSE - NONE OF THESE BELOW[goto nxt2]

        <1> Working at main job

                <2> Eating a meal or snack

                        <3> Sleeping at night
```

```
                                <4> Travelling; in transit

        --->[goto Fct2]

>nxt2<  INTERVIEWER ENTER BRIEF DESCRIPTION OF ACTIVITY: [allow 45][equiv ACT]
        (Only 44 characters allowed)

        ---> [goto whr1]

>Fact<  [if Frst eq <1>][store <working (at main job)> in ACT][goto twhr][else]
        [if Frst eq <2>][store <eating a meal or snack> in ACT][goto twhr][else]
        [if Frst eq <3>][store <sleeping at night> in ACT][goto twhr][else]
        [if Frst eq <4>][store <travelling; in transit> in ACT][goto twhr]
        [endif]
        [endif]
        [endif]
        [endif]

>Fct2<  [if nxt1 eq <1>][store <working (at main job)> in ACT][goto twhr][else]
        [if nxt1 eq <2>][store <eating a meal or snack> in ACT][goto twhr][else]
        [if nxt1 eq <3>][store <sleeping at night> in ACT][goto twhr][else]
        [if nxt1 eq <4>][store <travelling; in transit> in ACT][goto twhr]
        [endif]
        [endif]
        [endif]
        [endif]

>twhr<  [if Frst eq <4>][goto whr4][endif]  [*added Oct 22]
        [if nxt1 eq <4>][goto whr4][endif]

>whr1<  (ASK IF NECESSARY:)Where were you when you (were)
        "[fill ACT]"? [loc 1/23]

        <1> Home[goto whr2]
        <3> Away from home [goto whr3]
        <5> In transit [goto whr4]

        --->

>whr2<  (ASK IF NECESSARY:)Where in your house were you?

        <1> Kitchen                          <7> Garage
        <2> Living rm, family rm, den        <8> Basement
        <3> Dining room                      <9> Utility/Laundry Rm.
        <4> Bathroom                        <10> Pool, Spa (outside)
        <5> Bedroom                         <11> Yard, Patio, other outside house
        <6> Study/office

                        <12> moving from room to room in the house

        <x> Other (SPECIFY) [specify]

        ---> [goto tsmk]
```

```
>whr3<  (ASK IF NECESSARY:)Where were you?

          <1> Office building, bank, post office
          <2> Industrial plant, factory
          <3> Grocery store (convenience store to supermarket)
          <4> Shopping mall or (non-grocery) store
          <5> School
          <6> Public bldg (Library, museum, theater)
          <7> Hospital, health care facility, or Dr's office
          <8> Restaurant        <9> Bar, Nightclub
         <10> Church
         <11> Indoor gym, sports or health club
         <12> Other people's home
         <13> Auto repair shop, indoor parking garage, gas station
         <14> Park, playground, sports stadium (outdoor),
         <15> Hotel, motel
         <16> Dry Cleaners   <17> Beauty Parlor; Barber Shop; Hairdressers
         <18> At work: no specific main location; moving among locations
          <x> Other indoors (SPECIFY)[specify] <z> Other outdoors (SPECIFY)[specify]

        ---->[goto tsmk]

>whr4<  (ASK IF NECESSARY:) How were you travelling? Were you in a car,
        walking, in a truck, or something else?

         <1> Car
         <2> Pick-up truck or van
         <3> Walking
         <4> Bus/train/ride STOP
         <5> Bus
         <6> Train/Rapid transit
         <7> Other truck
         <8> Airplane
         <9> Bicycle
        <10> Motorcycle, scooter
         <x> Other (SPECIFY)[specify]

        ---->

>tsmk<  [#if Frst eq <3>][#goto tbrk][#endif] ***deleted 10/22/87 per PJ
        [#if nxt1 eq <3>][#goto tbrk][#endif]
        [#goto Osmk]

>Osmk<  Were you around anyone (else) who was smoking a cigarette, [loc 1/30]
        cigar, or pipe (while you (were)
        "[fill ACT]")?

        (OR USE AS NEEDED:)
        Any (other) smokers present?

        <1> Yes
        <5> No
```

```
        <8> DK; not sure
        <9> RF

        --->

>tbrk<  [if Frst eq <1>][goto brk][endif]
        [if nxtl eq <1>][goto brk][endif]
        [goto etml]

>brk<   (IF THIS CURRENT ACTIVITY IS "BEING AT WORK AT A PAID JOB.")

       While you (were):
        "[fill ACT],"
        if you WENT AWAY from your main place of work or main job site,
        either for job-related reasons, for personal business,
        or for lunch, breaks, or any personal errands,
        please report these activities separately.
        All of the time you spent in any one location while at work
        can be reported as one activity.


                [loc 2/20]
        (TYPE <g> TO PROCEED)

        --->

>etml<  [allow 7]

>etl<   [display acts single]What time did you finish
        "[fill ACT]"
        (and turn to something else?)[equiv etml position 1]

               Code <x> if last activity of diary day[goto ltim]

              <1-12>  --->[goto eyx]

>eyx<   [allow 1] [equiv etml position 3]
>eyl<   [store <:> in eyx]

>et2<           <00-59> --->[no erase][equiv etml position 4]

>et3<            <1> am
                 <5> pm --->[goto et3a][no erase]

>et3a<  [allow 2][equiv etml position 6]

>tet3<  [if et3 eq <1>][store <am> in et3a][else]
        [if et3 eq <5>][store <pm> in et3a][endif][endif]
        [goto sctl]

>ltim<  [store <11:59pm> in etml][goto sctl]

>sctl<  [store <> in adcl+]
        [store <OK> in STA]
```

```
        [if ATOT+ eq <10>][goto cls1][else]
        [goto CONT][endif]

>CONT<  [display acts single](TO CONTINUE ADDING ACTIVITIES,[loc 2/70]
        ANSWER YES.  TO REVIEW THE DAY'S ACTIVITIES,. ANSWER NO.)
        *IF ACTIVITY LASTED TWO HOURS OR LONGER, PROBE: "You've said that
        (activity) lasted quite a while.  Is there anything else that you
        might have been doing during that time that we've overlooked?"

            <1>  Continue adding activities[goto rap1]
            <5>  Finished adding activities

        --->[goto scla]


>rap1< [if STA ne <>][add <1> to ATOT+][roster append][endif]
       [goto nxt1]

>scla< [store <> in adc1+]
       [store <5> in cxx1+]
       [goto cls1]


>cls1< [roster close]

>chg1< [display acts]Thinking back over the 24 hour period we've just been
       talking about, is there anything we need to add or anything that we
       included that happened either before or after that period?
       (TO ADD :jb CONT n)

             <1>  COMPLETE LIST - neither add nor delete [goto tout]
             <5>  Delete an activity  [goto R71]
        --->


>R71<   [roster begin activity]

>del1<  Does "[fill ACT]"
        need to be deleted?

           <1>  Yes
           <5>  No

        --->

>tst1<  [if del1 eq <1>]
          [store <DL> in STA]
        [else]
          [store <OK> in STA]
        [endif]
        [goto R71a]
```

```
>R71a<   [roster end]

>blc1<  [store <> in chg1]
        [goto chg1]


>tim2<  [allow 4][loc 3/6]

>tout<  [if tim2 eq <>]
        [settime tim2][goto out][else]
        [goto out][endif]

        ROSTER TABLE
        ************


>acts<   [roster table activity <                                    ACT      etm1  STA>]


>cdst<  Begin coding diary?

        <1> Yes
        <5> No [goto out]

        --->

>TD1<   [roster begin activity]

>adtm<  [if STA eq <OK>][goto acst][else]
        [goto retd][endif]


>acst<  [if actN eq <1>][store <011> in ACCD][else][#work at main job
        [if actN eq <3>][store <108> in ACCD][else][#cooking
        [if actN eq <4>][store <439> in ACCD][else][#eat at home
        [if actN eq <5>][store <118> in ACCD][else][#dishes and kitchen cleanup
        [if actN eq <6>][store <129> in ACCD][else][#routine indoor cleaning
        [if actN eq <7>][store <459> in ACCD][else][#sleep at night
        [if actN eq <8>][store <408> in ACCD][else][#bath,wash
        [if actN eq <9>][store <409> in ACCD][else][#dress, personal hygiene
        [if actN eq <10>][store <449> in ACCD][else][#meal at restaurant
        [if actN eq <11>][store <302> in ACCD][else][#shopping-not food
        [if actN eq <12>][store <301> in ACCD][else][#shopping-food
        [if actN eq <13>][store <399> in ACCD][else][#shopping-travel
        [if actN eq <14>][store <752> in ACCD][else][#visit friends
        [if actN eq <15>][store <799> in ACCD][else][#travel for social activity
        [if actN eq <16>][store <919> in ACCD][else][#TV
        [if actN eq <17>][store <914> in ACCD][else][#cable,VCR
        [if actN eq <0>][store <> in ACCD][else]
        [if actN eq <>][store <> in ACCD]
        [endif][endif][endif][endif][endif]
        [endif][endif][endif][endif][endif]
        [endif][endif][endif][endif][endif]
        [endif][endif][endif]
```

```
>tnd1<   [allow 2][equiv tend position 1][#end time hours - 24 hour clock
>tnd2<   [allow 2][equiv tend position 3][#end time minutes

>tseq<   [if STA eq <OK>][goto pp3][else]
         [goto psen][endif]

>pp3<    [if etm1 eq <11:59pm>][store <2400> in tend][goto bdt][else]
         [goto p3][endif]

>p3<     [if et1 eq <12>][store <00> in tnd1][else]
         [store et1 in tnd1][endif]
         [store et2 in tnd2]
         [if et3 eq <5>][add <1200> to tend][endif]


>bdt<    [store PAT1+ in tbeg]
         [store tend in PAT1+]

>st1<    [subtime tbeg from tend into ETIM][#ETIM and CTIM will be wrong for
                                           [#out of sequence activities

>adt1<   [addtime ETIM to CTIM]

>psen<   [store Dcid+ in Dcid]
         [store car1+ in car1]

>acd2<   [if STA ne <OK>][goto retd][else]
                 [if ACCD eq <>][goto icod][else]
         [goto retd][endif][endif]

>icod<   INTERVIEWER ENTER ACTIVITY CODE FOR:
         "[fill ACT]"[equiv ACCD]


         <1-998> Enter two digit code from 'Table 1: Basic Code Categories'

         <999> Uncodable travel
         <000> No activity entered; no activity codable

         --->

>retd<   [roster end]

>CD<     Diary coding complete:[loc 2/73]

            <1> Yes
            <5> No

           --->
```

```
>out<   Exit the diary:

            <1> Diary entry COMPLETE

            <3> Diary entry NOT complete


            <5> Diary coding NOT complete
            <7> ALL diary coding COMPLETE


          --->

>cmpl<  [store CD in zCD]
        [store out in zout]
        [store <> in STRT]
        [store <5> in cxx1]
        [store <> in CD]
        [store <> in out]
        [if out isnt <7>][skip][endif]    ** coding finished: case to middle **
        [if out is <7>][return][endif]    ** don't sk users out as 7 easily **
        [complete]
```

Appendix C

Scientific Advisory Panel Members

Dr. Gerald Akland	U.S. Environmental Protection Agency
Prof. Maureen Cropper	University of Maryland/Resources for the Future
Dr. Naihua Duan	The Rand Corporation
Dr. Mel Kollander	U.S. Environmental Protection Agency
Dr. Wayne Ott	U.S. Environmental Protection Agency
Prof. John Spengler	Harvard University
Dr. Lance Wallace	U.S. Environmental Protection Agency

Appendix D

Sampling Methods for the 1987-88 California Activity Pattern Survey

A Report To:

California Air Resources Board
Sacramento, California

SAMPLING METHODS

FOR THE

1987-88 CALIFORNIA AIR RESOURCES TELEPHONE SAMPLE

by

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and
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Survey Research Center
University of California, Berkeley

January 1991

CONTENTS

Introduction

The 1987-88 California Activity Pattern Survey was designed to measure the exposure of California residents to airborne toxics in the home and the workplace and to obtain some additional information about the respondents' opinions and behavior. The survey was funded by the Air Resources Board of the State of California.

The Survey Research Center of the University of California, Berkeley, contracted to design a telephone sample of households of the State of California, assist in questionnaire construction, conduct the interviewing, and prepare the data for analysis. This report summarizes the sampling methods used for this study. The general design of the sample is given first. Then various aspects of the design are described in more detail.

1. General Design of the Sample

The sample is a clustered random-digit telephone sample of all households in California. The sample was generated using procedures described by J. Waksberg ("Sampling Methods for Random Digit Dialing," Journal of the American Statistical Association, vol. 73, March 1978, pp. 40-46). Households with no telephone, of course, are excluded. Households with no English-speaking adults were also excluded by design, in order to avoid the cost of translating the questionnaire and hiring bilingual or multilingual interviewers.

Prior to selection, all of the telephone exchanges in the state were grouped into three strata: South Coast Region, the San Francisco

Bay Area, and other areas of the state. When clusters of telephone numbers were selected for the study, the sampling fraction was doubled for the San Francisco Bay Area, in comparison with the South Coast Region; the sampling fraction was doubled again for other areas of the state. This oversampling was carried out in order to spread the selected households more widely over a variety of climatic zones.

Within each selected household, one adult aged 18 or over was selected at random to be interviewed. Part of the adult interview included an ennumeration of children aged 12 through 17 residing in the household. If a child in that age range resided there, permission was sought from the appropriate parent or guardian to administer a shortened version of the interview to the child. If more than one child in that age range resided in the household, one child, referred to as the "youth respondent," was selected at random to be interviewed.

2. Stratification

A goal of this study was to obtain information from households in a wide variety of climatic zones. Since most of the California population is clustered in a few metropolitan areas, an unrestricted sample would result in the completion of very few interviews in other more sparsely populated, but climatically diverse, areas of the state. A stratification of all the telephone exchanges in the state was carried out, therefore, in order to provide a means of oversampling the non-metropolitan areas and of distributing the sample over as many climatic zones as possible. There are two aspects of this stratification: the creation of

three explicit major strata, and an implicit geographic stratification within each of the major strata. Let us review each of these aspects in turn.

2.1 Creation of Three Major Strata

A list of all the central office telephone codes (prefixes) in California was taken from the August 1987 American Telephone and Telegraph V & H Coordinate Tape (produced monthly by AT&T). The record for each prefix includes the area code, the prefix (first three digits of a phone number), the name of the city or billing location, and two geographic coordinates (north-south and east-west). After deletion of prefixes for directory assistance and time, and of a few other prefixes known to be non-residential, the remaining prefixes were divided into three groups or strata.

The first stratum was the South Coast Region, comprising the South Coast air basin and San Diego County. Information on the boundaries of the South Coast air basin was obtained from the South Coast Air Quality Management District. That information was then compared with the city names on the prefix records (after sorting them on geographic coordinates) in order to decide into which stratum to place each telephone prefix. It turned out that the prefixes in the 818, 213, and 714 area codes cover that area almost exactly. As for San Diego County, prefixes in the southern part of the 619 area code were sorted from east to west; then place names were compared with a map; and the western portion was placed into the South Coast Region stratum.

The second stratum was the San Francisco Bay Area. Boundary information for that air basin was obtained from the Bay Area Air Quality Management District. The five-county center of that area coincides with the 415 area code. However, the air basin also includes Napa County, the southern portions of Sonoma and Solano counties, and the northern portion of Santa Clara County (principally San Jose). Prefixes in the 707 and 408 area codes were therefore sorted from north to south; then place names were compared with a map; and the appropriate prefixes were placed into the San Francisco Bay Area stratum.

The third major stratum consisted of all the California prefixes left over, after creating the first two strata. Because of the heterogeneity of this third stratum, we found it desirable to carry out some further stratification, as described next.

2.2 Further Implicit Stratification

Prior to the selection of primary clusters, prefixes within each area code (or within each part of an area code, if it had been divided between major strata) were sorted geographically, using the north-south and the east-west coordinates on the AT&T tape. The direction of the sort for each area code is shown in Table 1. For example, all of the prefixes in area code 818 fall within the South Coast major stratum, and they were sorted from north to south (n-s).

The purpose of this sorting was to distribute the sample proportionately over the various regions within each major stratum. The third stratum in particular ("other areas of the state") includes several

Table 1

STRATIFICATION OF AREA CODES AND PREFIXES

(Treatment of 10 California Area Codes)

Area code	Portion	Sort	Location
1. South Coast Region			
(818)	all	n-s	Los Angeles Co.
(213)	all	n-s	Los Angeles Co.
(714)	all	w-e	Orange, Riverside, part of S. Bern. counties
(619)	SW part	e-w	San Diego County
2. San Francisco Bay Area			
(707)	S part	n-s	Napa Co., S. parts of Sonoma and Solano
(415)	all	n-s	S.F., Alameda, Contra Costa, S. Mateo, Marin
(408)	N part	n-s	Santa Clara Co.
3. Other Areas of State			
(707)	N part	s-n	North coast
(916)	all	n-s	Northern valley and mountains
(619)	N & SE	n-s	Desert
(209)	all	n-s	Central valley
(805)	all	e-w	Central valley and coast
(408)	S part	s-n	Central coast

Note: Prior to systematic random selection of primary clusters, prefixes within each (part of an) area code were sorted geographically in the direction indicated; the sorted area code lists were then put together in the order shown into one list for each major stratum.

regions of distinct interest. This sorting procedure ensured that each of the regions were included in the sample in proportion to its number of telephone prefixes.

After the prefixes were sorted within area code, all of the prefix lists within a major stratum were put together into one list, in the order given in Table 1. The lists for each major stratum were then ready for the selection of primary clusters.

3. Selection of Primary Clusters

Our goal for the first stage of sampling was to identify approximately 250 clusters of residential telephone numbers throughout the state. Most random telephone numbers are either non-working, business, or government numbers. In order to identify 250 residential numbers, we estimated (based on past experience) that we should start with about 935 numbers. Since it is preferable to subsample an equal number of units within each cluster, the oversampling of certain parts of the state was done at this stage of primary cluster selection.

Within each of the three major strata we selected a certain proportion of possible telephone numbers by systematic random sampling -- that is, by setting a selection interval, taking a random start, and then selecting every nth number. The systematic nature of the procedure ensured that the implicit geographic stratification of the prefixes would be preserved.

The proportion of telephone numbers selected from each major stratum is shown in Table 2. In the South Coast stratum, for example, we

Table 2

SELECTION OF PRIMARY CLUSTERS

	No. Prefixes	Selections	Fraction
Major Stratum			
South Coast	1532	194	.127
S.F. Bay Area	759	192	.253
Other Areas of State	1085	550	.507
	3376	936	

selected 194 out of 1532 prefixes (each of which has 10,000 possible telephone numbers), or .127 of the prefixes. The proportion selected was doubled for the San Francisco Bay Area, and doubled again for the other areas of the state. This disproportionate sampling was carried out in order to spread the sample over a wide variety of climatic zones. Without such disproportionate selection, the sample would have been clustered primarily in a few large urban areas. Note that a weight inversely proportional to the rate of oversampling must be used in the data analysis if statewide estimates of statistics are made.

After the primary telephone numbers were selected, each was called and administered a short screening interview to determine if the number was a residence. If it was not, that cluster was dropped from the sample. If, on the other hand, the number was a residence, additional telephone numbers within that cluster were generated for the main study. Of the 936 original telephone numbers, 252 were determined to be residences and formed the clusters for our sample.

4. Selection of Telephone Numbers

The telephone numbers within each cluster were generated by varying at random the last two digits of the primary number. For example, if the primary number for a cluster was (415) 642-6578, additional telephone numbers within the cluster were generated by replacing the "78" with one of the 99 other two-digit possibilities.

Under the clustered sampling procedure, a set of telephone numbers is prepared for interviewing from each cluster. If a telephone number

turns out to be non-residential, it is replaced. The total number of residences in each cluster, consequently, remains fixed. The probability of selecting a household is constant across clusters (within major strata), provided that the same number of residential telephone numbers has been set up for interviewing. For this study, most clusters had 11 residential numbers, although a few clusters had a different number. A weight to adjust for this variation could be used in data analysis, although its effect would be negligible in this case. Weights to adjust for major differences in selection probabilities are discussed next.

5. Creation of Weights for Each Case

Weights were computed to adjust for unequal probabilities of selection and also to balance results by season and day of the week. We will describe each of these two types of weights.

5.1 Adjustment for Selection Probabilities

Households in the three major strata were selected into the sample at different rates, as described above in Section 3. Analyses which pool data from different strata, consequently, should use a weight to adjust for those different selection probabilities. Otherwise the resulting statistics will disproportionately reflect persons residing in the oversampled rural areas and the San Francisco Bay Area.

Another factor affecting the probabilities of selection is the number of adults and eligible youth in each selected household. Since

only one adult and one eligible youth were selected for interviewing in each household, persons residing in small households were more likely to be selected than persons in large households.

One other factor that should be taken into account is the number of distinct telephone numbers that ring in each household. A person who can be reached on two telephone numbers has twice the chance of being selected as a person with only one number. The former should therefore receive half the weight of the latter in computing statistics.

All three of these factors were taken into account in computing a weight to adjust for unequal probabilities of selection. The weight for each adult respondent was computed as follows:

$$W = kp/gt$$

where,

p = number of eligible persons (age 18 or over) in the household
g = geographic factor
(South Coast=1; Bay Area=2; Rest of State=4)
t = number of telephone numbers into household
k = a constant, the same for all adults, selected to make the weighted number of adults equal the actual unweighted number of adult respondents.

The weight for each youth respondent was computed in the same way. The values of g and t were the same as for the adult respondent in the same household. The value of p, on the other hand, was the number of eligible youth in the household. The value of k was set to make the weighted number of youth match the unweighted total of youth respondents.

These two weights are contained in the data record for each case. They are identified in the codebook with the following names:

sampwt Adult household sampling weight
ysampwt Youth household sampling weight

5.2 Adjustment for Season and Day of Week

The activities asked about during the interview always referred to "yesterday." Since activity patterns vary by season and day of the week, it is necessary to take into account just when the interview was done. A disproportionate number of interviews were done on weekends, for instance, because that is when many people are more likely to be home to answer the telephone. The distribution of interviews over the four seasons was also not exactly the same.

In order to adjust for the distribution of interviews over days of the week and seasons, a weight for each respondent was computed. For purposes of computing this weight, we classified each completed interview by the day of the week on which the reported activities took place (not the day of the interview itself, which was a day later); the days were combined into three categories: Saturday, Sunday, and weekday. Similarly, we classified each completed interview by the season during which the reported activities took place; the seasons were defined by the four sets of calendar quarters: January-March, April-June, July-September, and October-December.

If the interviews had been spread perfectly evenly over the year, we would expect that the proportion reporting on activities for a Sunday in spring, for example, would be (1/7)*(1/4) = (1/28). The same proportion applies to a Saturday or a Sunday in each of the four seasons. The corresponding expected proportion for a weekday in each season is

(5/7)*(1/4) = (5/28).

To compute the appropriate adjustment, we generated the actual distribution of respondents across the three day-categories and the four season-categories. The proportion expected in a given category (if the interviewing had been perfectly spread out), divided by the proportion actually obtained, is the adjustment factor. For example, we expect 5/28 of the cases to report on activities referring to a weekday in the summer. If the actual proportion referring to a weekday in the summer is only 4/28, the adjustment factor is (5/28)/(4/28) = (5/4) = 1.25. This means that every completed case that reports on activities for a weekday in the summer would be assigned a weight which incorporates that adjustment factor.

Since we wanted to combine this adjustment with the adjustment for unequal selection probabilities into a single weight, we used this latter weight in generating the season-by-day classification. This second weight for each adult respondent was then computed as follows:

$$W' = hfW$$

where,

f = the seasonal adjustment factor, as described above
W = the weight to adjust for selection probabilities
h = a constant, the same for all adults, selected to make the weighted number of adults equal the actual non-weighted number of adult respondents

The corresponding weight for each youth respondent was computed in the same way, except that the day-of-week adjustment was computed by combining Saturday and Sunday into a single weekend category. (There were not enough cases to make adjustments for individual days of the week.) Also, the youth weight for selection probabilities was used in

the computations.

The weights to adjust for season and day of the week are included in the data record for each case. Note that these weights include the adjustment for selection probability. They are identified in the codebook with the following names:

timewt	Season weight for adult diary
ytimewt	Season weight for youth diary

5.3 Which Weight to Use

The sample was deliberately designed, at the request of the sponsor, to overrepresent the non-metropolitan parts of the state, and the San Francisco Bay Area, relative to the South Coast area. If statistics are being computed separately for geographic areas that do not pool cases from more than one of the major strata, one might consider not using any weights at all. The values of the weight for selection probability do not vary much within each major stratum. And since the adjustment for season and day of the week was done on the basis of the full statewide sample, the corresponding weight may not be appropriate for a given subsample.

On the other hand, if statistics are being computed for the entire state, it is quite important to use at least the weight to compensate for unequal probabilities of selection ("sampwt" for adults; "ysampwt" for youth). Otherwise there is likely to be a bias because of the over-representation of certain parts of the state.

The weight to adjust (also) for seasonal and day-of-week effects could be important if a statewide analysis is focusing on variables or

activities which are sensitive to the weekend/weekday distinction or to the particular time of the year. Since much of this study concerns such variables, it is probably a good idea to use these weights ("timewt" for adults; "ytimewt" for youth) most of the time.

6. Field Outcome and Response Rates

The disposition of each sampled household and each enumerated youth respondent is summarized in this section. We will discuss each of these two outcomes in turn.

Table 3 shows the results for each of the telephone numbers selected as described above in Section 4. As shown in Table 3, a total of 4969 telephone numbers was set up for interviewing. Of that number, 2368 were not eligible households. Interviews were attempted with the remaining 2601 households. Of these 2601, interviews were completed with a randomly selected adult in 1579 households, yielding a response rate of 60.7 percent. The proportion of refusals was somewhat larger than we usually encounter in general population telephone samples, due perhaps to the relatively demanding nature of this interview.

The results for youth are given in Table 4. We enumerated 256 children between the ages of 12 and 17. Of that number, we completed interviews with 183, or 71.5 percent. The largest source of non-response for youth was informant refusals. In such cases the adult with whom the interviewer was speaking (usually the parent) refused to allow the selected young person to be interviewed. Note that we did not attempt to select and interview a young person unless the adult inter-

view had been successfully completed. Statistics for youth, consequently, will be based on those households in which both an adult and a young person completed the interview.

Table 3

OUTCOME FOR HOUSEHOLDS AND ADULTS SAMPLED

	Number	% of Total	% of Eligible
Total Selections	4969	100.0	
Ineligible for the Sample			
Not in service	1303	26.2	
Not a residence	847	17.0	
Never answered*	57	1.1	
Not English speaking	161	3.2	
Total ineligible	2368	47.7	
Eligible Sample Units	2601	52.3	100.0
Non-response			
Informant refused	535	10.8	20.6
Respondent refused	232	4.7	8.9
Respondent never home	178	3.6	6.8
Respondent cannot participate	60	1.2	2.3
incomplete diary	17	.3	.7
Total non-response	1022	20.6	39.3
Completed adult interviews	1579	31.8	60.7

*Never answered after at least 35 calls.
Most are disconnected business numbers.
A small proportion could be residential.

Table 4

OUTCOME FOR ENUMERATED YOUTH RESPONDENTS

	Number	% of Enumerated
Total Enumerated Youth	256	100.0
Non-response		
Informant refused	45	17.6
Respondent refused	5	2.0
Respondent never home	19	7.4
Respondent cannot participate	3	1.2
incomplete diary	1	.4
Total non-response	73	28.5
Completed Youth Interviews	183	71.5