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## INTRODUCTION

It is often assumed that the impact of similiar noise levels is different at different times of day. If there are such differences in sensitivity then it is necessary to identify the particular hours at which there is a heightened sensitivity.

There is evidence suggesting that it is not possible to measure the differences in sensitivity between reactions during the day, evening and night (Fields, 1985). The difficulty arises from the high correlations between day, evening and night noise levels. Correlations would be even higher for adjacent hours of the day and thus it would clearly not be possible to measure differences in sensitivity between reactions in particular hours. In short, direct analyses of people's responses to noise will not aid in determining the boundaries of noise-sensitive time periods.

One possible basis for establishing the boundaries of noise-sensitive time periods is the prevalence of noise-sensitive activities during different time periods. This requires information about the proportion of the total population and of various subgroups which are engaged in noise-sensitive actitivies at different times of day.

Several noise studies have published some information about the timing of sleeping periods in selected areas in France (Aubree, et al., 1971, p.429; Francois, 1977; p.17), England (Brooker and Nurse, 1983, Figure 2) and around Heathrow (Second Survey of..., 1971; p. 43).

Other large-scale, non-noise surveys of people's daily activities have collected much more extensive information about the timing of different types of activities for national populations. Previous analyses of these surveys have provided information about the amount of time that people are engaged in
different activities (Juster and Stafford, 1985). Such analyses have not however provided detailed information about the timing of activities.

This report analyses the data from the 1976 Time Use Survey conducted by the Institute of Social Research at the Iniversity of Michigan. These analyses provide information about the timing of noise-sensitive activites of the adult population of the Inited States. Detailed hourly data provide estimates of the proportions of the adult population which are engaged in noise-sensitive activities. On the bases of these data some broad observations are made about two issues: the prevalence of noise-sensitive activities and the timing of (time-period boundaries for) noise-sensitive activities. Some general trends in the data are identified, but no attempt is made to develop parsimoneous models to describe the ways in which patterns of time-use vary with the time of day.

The study methods used in the time-use survey are described in the next section of this report. The section after that provides the basic information on the percentages of the population which are engaged in noise-sensitive activities during each hour of the day. Results are presented separately for weekday and weekend days. The possibility of seasonal differences is considered. In the final section of the report, patterns of noise-sensitive activities are compared for population groups which are defined by age, sex, section of the country and degree of urbanization.

DATA FOR THE ANALYSES

The data for these analyses come from a large scale, longitudinal time-use survey conducted by the University of Michigan's Institute for Social Research. A representative sample of adults in the Inited States was interviewed about their activity patterns at four times during 1975-76. All survey procedures
have been described in detail in previous publications (Juster, et ale, 1978; Juster and Stafford, 1985).

The time-use survey probability sample was designed to represent the adult population of the coterminous United States exclusive of those on military reservations. The 74 sample points are located in 37 states and the District of Columbia. The sample was stratified by geographical area. A total of 1519 people were interviewed in the first wave. By the fourth wave 947 people were interviewed. Of the total sample, 975 people were identified for whom there were interviews on at least one weekday, one Saturday and one Sunday. Approximately 970 of these respondents provide the data for the analyses in this report. The data from these respondents have been weighted to provide results which are representative of the population of the United States. Weights were applied to account for attrition from the first to fourth wave, the number of eligible people in the household, and discrepancies between characteristics of respondents and characteristics of the population provided by Bureau of the Census data.

The initial interview was conducted in person in October and November (mostly November) of 1975. Follow-up interviews were conducted by telephone in three waves: February-March 1976 (mostly in March), May-June 1976 (mostly in May) and September 1976. Other data, not analyzed in this report, were collected about activities of spouses and children. A second follow-up study was conducted with an additional four waves of data in 1981 , but is not included in this report. The bases for these and other decisions about data selection are provided in appendix $A$.

The information about activities and the timing of the activities was gathered using a time diary technique in which the respondent provides a
detalled description of activities during the 24 -hours of the previous day. Each respondent was asked:
"...we would like to know about the things you did on... (DIARY DAY) At one minute after midnight, the beginning of... (DIARY DAY)... what were you doing?"

The interviewer then recorded a description of the activity and the time at which each activity began and ended (to the nearest minute) as well as recording answers to the following questions:
"Where were you? [HOME, TRANSIT, WORK, OTHER]
"Who was with you?
"Were you doing anything else at the same time (like talking, reading, watching TV, listening to the radio, eating, or caring for children)?"

Space was provided in the standard interview for the recording of 65 activity episodes in the time-diary. (A sample page is reproduced in appendix B). The activities were coded into several hundred categories. Forty of these activity categories were identified and combined with the information about being at home in order to determine whether people at home were engaged in either of two noise-sensitive activities, sleeping or aural communication. The exact code categories are presented in appendix $B$ and briefly described in the text.

An effort was made to obtain interviews on weekdays as we 11 as on Saturday and Sunday. The interviews in the first and last waves tended to produce time-diary data for weekdays. As a result there is a correlation between the season of the year. This correlation is discussed later.

The individual interview data were analyzed to provide the aggregated data records which were directly manipulated in the analyses presented in this report. The unit of analysis in these analyses is thus the measure of the proportion of a particular population group which was engaged in a noise-sensitive activity during a particular hour. A separate data set which has individual respondents as the unit of analysis was produced but has not been directly analyzed for this report. Since the present analyses are based on complex, weighted aggregated data, no attempt has been made to calculate such inferential statistics as standard errors or $95 \%$ confidence intervals. DESCRIPTION OF NOISE-SENSITIVE ACTIVITY PATTERNS

The extent to which people are at home and the prevalence of noise-sensitive activities have been calculated for each hour of the day on the basis of people's reports on the time when they were engaged in activites on the previous day. The results of these calculations can be found in appendix $C$ and in the figures. Figure 1 reports the activity patterns averaged over weekdays (Monday through Friday).

The "percentage of time". which is recorded for each hour in figure 1 is the percentage of the total minutes in the hour during which respondents reported engaging in the particular types of activities. This percentage is a good indicator of the average number of people who are engaged in an activity at any particular moment in the hour. This is the measure of activity level which will be used in most of this report. An alternative measure of the total number of people engaged in an activity during an hour is briefly discussed later in this section.

The percentage of time at home ranges in figure 1 from roughly $95 \%$ in the middle of the sleeping period to $35 \%$ during the day. The continuing trend
toward higher employment rates for women may have partially decreased the percentage at home during the day from these rates which come from a 1975 survey. Nonetheless it is clear that these residential areas are not empty during the normal working day.

In the afternoon there is a steady increase in the proportion of adults at home beginning at about 1500 or 1600 , we 11 before adults would return from work. This may indicate that adults are returning home to meet school children. The steady rise in the evening is interrupted after the 1700 to 1800 evening meal for the two hours when many evening activites occur outside the home. In figure 1 it can be seen that virtually all people who are at home are sleeping at 0300 and that less than $5 \%$ of the time is spent sleeping in the middle of the day. (Codes for daytime naps are also included in the sleeping periods in appendix B.) The transition periods between these nighttime and daytime extremes are long enough to be important. The low daytime level is not achieved until about 0900 and the rates for sleeping begin to increase in the evening as early as 2100. The standard nighttime period for time-period weighted noise indices such as Day-Night Sound Leve 1 (LDN) begin at 2200 when approximately a quarter of the population have already begun to sleep and end at 0700 when a quarter of the population (probably a different quarter) are still sleeping. While the exact percentages of the population which are protected by a 2200 to 0700 period can not be calculated directly, it does appear that roughly half of the population has at least some of their sleep period which is outside of the 2200 to 0700 period.

The reports of aural communication in figure 1 include interactions with children, socializing with people at home, any conversations, meals when another person is present and listening to TV, radio or other audio equipment. Such communication often was recorded as a secondary activity (see sub-item 6 for the interview question in appendix $B$ ). The growth in aural communication during the afternoon parallels that for numbers of people at home. In both cases the increase begins at 1600. Such communication peaks in the prime television viewing hours before dropping as people go to bed.

In figure 2 the two noise-sensitive activities have been summed to provide a curve which shows the combined percentage of time being spent in noisesensitive activities. This combined presentation more clearly shows the quite steady rate of increase in noise-sensitive activities over the 1600 to 2300 time period. The daytime low of about $15 \%$ extends from only about 0900 to 1600 .

## An Alternative Measure of Activity Level

In other parts of this report activity levels are measured as the percentage of time during which people are engaged in noise-sensitive activities for each hour of the day. For a short-duration noise, such as aircraft noise, this also provides a good indicator of the percentage of the population which might be engaged in a noise-sensitive activity during a single noise event. For more continuous noises, such as road traffic, an alternative measure might also be considered, a measure of the percentage of the people who were ever engaged in the noise sensitive activity during at least a part of an hour. This measure is compared with the percentage-of-time measure in figure 3.

The new, ever-engaged-in-activity measure in figure 3 necessarily provides higher estimates of the number of people exposed than does the time-exposed measure. The two measures could only provide exactly equal estimates for an hour if all people engaged in the activity for the entire hour. The gap between the measures is correspondingly slight for sleep, especially in the middle of the night, but the gap is much larger for the aural communication activity. These alternative measures of the numbers of people engaged in noise-sensitive activities thus yield different estimates of the magnitude of noise-sensitive activities. The two measures do not differ, however, in respect to the timing of the noise-sensitive activities. Thus the conclusions which might be drawn about the boundaries between the highly and less highly noise-sensitive periods would be similar for the two measures.

The remainder of the discussion in the text will refer to only the percentage-of-time measure. Appendix $C$, however, includes a complete set of tables for both measures. Estimates of the percentage of the population which would be engaged in noise sensitive activities for at least a short time during any particular hour can thus be obtained from appendix $C$.

The size of the gap in figure 3 between the numbers of people at home and the numbers of people who ever engage in any aural communication during an hour at home implies that roughly half of the people at home have no aural communication at all in each hour during the daytime. It could be that people under-report the amount of aural communication they are engaged in. This might be especially likely if they had short communications or if they fail to continue to report the presence of background music. The gap does suggest that the absolute magnitudes of aural communication activities should be interpreted cautiously especially for the measures of the percentages of people ever engaged
in an activity during an hour. It is assumed that any such underreporting would not, however, distort the conclusions which might be drawn about the boundaries for time periods based on analyses of the time engaged in different activities.

Patterns for Different Days of the Week and Seasons of the Year
Noise-sensitive activity patterns for the two combined weekend days are presented in figure 4. General differences between weekday and weekend days can be observed from a comparison with figure 1 . However, a better understanding of activities on different days of the week is obtained by comparisons of four different sets of days (Friday, Saturday, Sunday and Monday through Thursday) in figures 5, 6, and 7. The comparison reveals both similarities and differences in the timing of activities and the incidence of noise-sensitive activities on different days.

With respect to the timing of activities, figure 7 shows that the sleep period is extended by approximately one hour on the two weekend mornings. Other more moderate differences in sleep patterns show that the similarities are between Friday and Saturday or between Sunday and Monday through Thursday. Only the sleep activity displays such differences in the boundaries for noise-sensitive activities on different days of the week. Thus for the purposes of setting boundaries between noise-sensitive periods of the day, the weekend might best be defined as the period from early on Friday evening to early on Sunday evening. The boundaries between noise-sensitive periods could remain the same for weekdays and weekends except that the sleep-sensitive period should be extended by about one hour on Saturday and Sunday mornings.

With respect to the prevalence of other noise-sensitive activities there are substantially more people at home and more aural communication activities on weekends. The number of people at home increases by nearly half. This brings the numbers of people at home or engaged in communication activities during the day on weekends up to the numbers which are observed on weekdays at about 1700 , but not up the weekday numbers for later in the evening. In the middle of the day on Saturday or Sunday the percentage at home is still less than $60 \%$. The fact that fewer people work on weekends seems to be at least partially offset by the prevalence of other activities away from the home on weekends. Friday differs from the average for the other four weekdays in that there is noticeable less time spent at home and in aural communication activities.

In this study the day of the week is related to the time of year for the interview. In table I it can be seen that most of the weekend diary days came from the February-March and May-June interviewing waves, while most of the weekday time diary days came from either the first wave (October-November 1975) or the last wave (September 1976). The percentages have been calculated in two different directions in table $I$. The percentages in the upper left corner of each cell are the percentages of the interviews in a wave which are for each diary day (eg. $61 \%$ of the November interviews were for Monday-Thursday). The percentages in the bottom right corner are the percentages for a diary day which come from each wave (eg. $44 \%$ of the Monday-Thursday dairies come from the November interviews).

Interviews were thus conducted in three seasons of the year, but not in the summer months when activity patterns might be affected by summer vacations or by children being home from school. The time at home and activity patterns for the four interviewing waves are compared in figures 8, 9 and 10. In general
differences between the interviewing waves are small (less than those for the day of week) and difficult to interpret because of the correlation in the study design between day of week and season of interview. The sleep patterns for the different seasons are virtually identical in figure 10. There is a weak tendency for the November wave to be home more in the evening, however, this pattern may be at least partly inflated by the fact that the November wave had a sma11 proportion of Friday and Saturday interviews (20\%). The other waves resembled one another in that from 41 to $48 \%$ of the diaries were for Friday or Saturday. This at least suggests that the slightly reduced time at home in May could indicate that there is generally less time at home in warmer months in the evening. The policy implications for noise control are not, however, clear. People may be engaged in less aural communication at home in the evenings in warm months, however, the remaining aural communication may take place under conditions which are more sensitive to the presence of noise, i.e., out-of-doors or with the windows open.

## COMPARISONS OF PATTERNS FOR DIFFERENT POPULATION GROUPS

Weekday activity patterns are presented in figures 11 through 22 for sectors of the population which are defined by sex, age, urbanization, and region of country. Tables in appendix $C$ provide the supporting data as well as the same breakdowns for weekend patterns and for the measure of the percentage of people ever engaged in the activity during each hour.

In figures 11 and 12 it is seen that women are home more and engaged in aural communication much more than men during the day and slightly more than men during the evening. Sleep patterns are virtually the same. Presumably these differences between men and women may have been reduced some since 1975 -76 with the increased employment of women outside of the home.

In figures 14 and 15 there is evidence that people over 65 are home much more and engaged in much more aural communication. They are also more likely to take naps during the middle of the day (figure 14). A rather high proportion attempt to nap at some time during the middle of the day. Table $C-9$ shows that in the four early afternoon hours (1200-1599 on weekdays) the percentages of those over 65 attempting to nap during each hour are $12 \%, 18 \%, 15 \%$ and $12 \%$.

Activity patterns are compared for three degrees of urbanization in figures 17 to 19. Activity patterns do not appear to systematically differ in the figures. There is no support for belief that people in urban areas are at home less or have later sleeping periods. The lack of any patterns could be partially due to the choice of Standard Metropolitan Statistical Areas to define urbanization; a choice which results in considerable overlap in the types of communities which are included in the different urbanization categories (see appendix B).

Activity patterns are presented separately for each region in figures 20 to 22. There appears to be a weak tendency for people to be at home and engaged in aural communication more in the South. There is somewhat less than a one hour difference in the timing of sleep between the two most extreme regions (South is earliest, North-east is latest).

## CONCLUDING REMARKS

Data from a 1975-76 nationally representative sample survey have been analyzed to provide estimates of the percentage of the population which is engaged in noise-sensitive activities during each hour of the day on weekdays, Fridays, Saturdays and Sundays. Estimates are provided of the percentage engaged in aural communication activities at home, sleeping at home, or simply
at home. The day can be roughly divided into four noise sensitivity periods consisting of two relatively steady state periods, night ( 2400 to 0500 ) and day (0900 to 1600 ), and the early morning and evening transition periods. Weekends differ from weekdays in that the morning transition period is one hour later and the numbers of people engaged in aural communication during the day at home is approximately one-half to three-quarters greater.

The percentage of the population engaged in either of the two noise-sensitive activities on weekdays varies from a nighttime high of $95 \%$ to a daytime low of about $15 \%$. The low daytime activity level extends from approximately 0900 to 1600 . The percentage of the population engaged in aural communication activities increases from 1600 and the percentage sleeping increases from 2000. Even during the daytime on weekdays there is a substantial proportion of the population which is at home (over $35 \%$ ).

The extent and timing of noise-sensitive activities was found to be similiar for all parts of the Inited States, for different sizes of urban areas, and for the three seasons surveyed (September through May). Women and people over 65 are much more likely to be home during the daytime on weekdays. The timing of activity periods does not differ greatly by sex or age. There was less than a one hour difference for even the strongest pattern (people under 25 years of age go to bed earlier and arise later than people over 65).

## ACKNOWLEDGEMENT

The data for the time-use survey were originally collected by the Institute for Social Research at the Iniversity of Michigan. The data collection was supported by the National Science Foundation (grant numbers SOC74-20206, SOC74-20206A01, SOC74-20206A03, and RDA75-21077) and by the U.S. Department of Health Education and We1fare (grant number RDA75-21077). Recoding of the data for the analyses in this report was carried out at the Institute for Social Research.

APPENDIX A: OPTIONS SELECTED FOR PROCESSING TIME-IJSE DATA
Five major decisions relating to the processing of the data in the time-use data file are described in this appendix. The decisions relate to the (l)study year (2) inclusion of secondary respondents from households (3) weighting of the sample (4) division by day of week (5) division by season of year. The day-of-week and season-of-year issues are discussed because these two variables are correlated with each other and with sample attrition. About $3 / 4$ of the Monday through Friday interviews were conducted in September or May while about $3 / 4$ of the Saturday and Sunday interviews were conducted in the two remaining waves. The characteristics of the sample, if no weights were used, would be expected to change from the first interview to the last interview due to higher attrition rates for the more mobile sectors of the population. For this particular survey design this means that attrition is related to season of survey and day of week.

1. Year of survey

Time use data are available for both the first phase ( 4 waves in 1975-76) and the second phase ( 4 waves in 1981-82). The first (1975-76) phase sample was selected to represent the population of the Inited States and is thus more useful for this report. The 1981-82 sample is largely a subset of the earlier sample which could provide information about any changes in the intervening years. The $1975-76$ sample also has the advantage of being larger.

## 2. Secondary respondents

The 1975-76 sample of a single selected individual from each household is supplemented with interviews with spouses (wife if the original respondent is male or husband if the respondent is female). Including these spouses in the analyses would generally lead to greater precision because of the larger sample size for the analyses of sleep and time at home. However, analyses concerning aural communication could not utilize secondary respondents. The spouse data were not suitable for the aural communication analyses because information about secondary activities was not collected for the spouses. This creates no problem for sleep since sleep is a primary activity, but since aural communication is of ten combined with another activity (eg. listening to the television and sewing) estimates of aural communication using spouses would have underestimated the amount of aural communication activities. The spouses were excluded from the other analyses partly because this lead to economies in data analysis planning and partly because the use of only primary respondents for all activities simplifies the comparisons between activities. The data from the spouses are available for future sleep or time-at-home analyses if they are needed.
3. Weighting of sample

Inless otherwise noted, the results presented in this report have been corrected with two types of sample weights. A "Census weight" is applied to account for discrepancies between the 1975 Wave 1 sample characteristics and the 1975 Census parameters for age, sex, education and urbanicity. A "Panel Loss weight" is applied to the sample to account for the attrition from the

1519 respondents of the Wave 1 sample to the final number of approximately 975 panel respondents who had interviews on three or four waves. The weights were used inorder to provide the best estimates of population parameters even though this somewhat increases the variance of study estimates. A visual comparison of the weighted and unweighted results for weekdays and weekends did not identify any important discrepancies.
4. Day of Week

Time use patterns are always reported separately for weekdays and weekends. The weekday and weekend data were not combined since, as the analyses in the report show, there are significant differences between weekdays and weekends in the morning sleeping period and the daytime aural communication patterns. The smaller differences between Friday and other days of the week and between Saturday and Sunday were also described in the body of the report. The "weekend" interviews are approximately equally divided between Saturday and Sunday. The "weekday" data, however, slightly over weight the effect of Friday since about one third of the weekday interviews refer to Friday.
5. Season of Year

Time use patterns are averaged over all seasons except where the seasonal differences are analyzed. The small seasonal differences did not justify separate analyses throughout the report. It should be remembered that there may be greater differences which could not be studied with this data set because no data were collected for the summer months when children are out of school. It was noted above that season and day of week are not independent in the complete sample of all survey interviews. Since the season of the
survey appears to have little effect on activity, the combining of data from different seasons would not appear to have seriously distorted the weekday and weekend results presented in this report.

## APPENDIX B: SURVEY QUUSTTION AND CODING


(MARK COLUMNS $5 \& 6$ "INAP" WHEN Hot ASKED)

## Codes for Defining Sleep and Aural Communication

Respondents who were at home and reported activities which were included in either of the two following codes were classified as sleeping:
459. Night sleep; longest sleep for day; (may occur during day for night shift workers) including "in bed, but not asleep
469. Naps and resting: rest periods, "dozing," "laying down" (relaxing code 981)

Respondents who were at home and reported any of the following activites were classified as engaged in aural communication:
221. Helping/teaching children learn, fix, make things; helping son bake cookies; helping daughter fix bike (homework code 222)
222. Help with homework or supervising homework
236. Giving child orders or instructions; asking them to help; telling them to behave (receiving instructions, code 976)
237. Discipling child; yelling at kids, spanking children (being disciplined--code 966); correcting children's behavior
238. Reading to child
**** NOTE: Codes 239, 249, 259 are adult on 1 y codes
239. Conversations with household children only; listening to children
249. Indoor playing; other indoor activities with children including games ("playing" unless obviously outdoor games)
259. Outdoor playing; outdoor activities with children including sports, walks, biking with, other outdoor games
752. Visiting with others; socializing with people other than $\mathrm{R}^{\prime} \mathrm{s}$ own HH members either at R's home or another home (visiting on the phone, code 961); talking/chatting in the context of receiving a visit or paying a visit.
769. Party; reception, weddings
789. Other events; other events or socializing, don't fit above
909. Radio
919. TV
929. Records, tapes, "listening to music," listening to others playing a musical instrument
961. Phone conversations--not coded elsewhere, including all visiting by phone
962. Other talking/conversations; face-to-face conversations, not coded elsewhere (if children in HH only, code 239); visiting other than 752 or 963
963. (ADULT DEFINITION) Conversation with HH members on 1y--adults only or children and adults; (children only, code 239)
964. Arguing or fighting with people other than HH members only, household and nonhousehold members, or NA
965. Arguing or fighting with HH members on 1 y
439. Meals at home; including coffee, drinking, smoking, food from a restaurant eaten at home, "breaking," "lunch" [Only included if someone else is coded as present in response to subquestion 5 .

300-399 Obtaining goods and services [Only included if someone else is coded as present in response to subquestion 5]

## Code for Urbanization

The definition of urbanization is based on types and boundaries of the Standard Metropolitian Statistical Areas as defined by the Bureau of the Census in 1974. The use of SMSA's for the definition results in outlying suburbs and small communities being grouped with large cities in some instances. The three urbanization categories are:

1. Central Cities with populations of over 100,000 in SMSA's and other places with populations of over 100,000 in SMSA's.
2. Places with populations of 50,000 to 99,999 in SMSA's.
3. All other places (mainly not SMSA's).


## APPENDIX C:

DETAILED HOURLY ACTIVITY DATA FOR ALL INTERVIEWS AND FOR 19 SUBGROUPS FOR WEEKENDS AND WEEKDAYS


OAY OF HEES
MON-THRU 93.794 .895 .695 .895 .793 .987 .470 .053 .344 .839 .538 .439 .036 .736 .840 .148 .562 .268 .665 .568 .876 .383 .488 .5 FRIDAY 91.292 .893 .694 .494 .691 .681 .561 .842 .334 .229 .126 .529 .028 .727 .430 .139 .953 .060 .856 .459 .464 .974 .580 .8 IITERUIEN IFNE (PRIHARY MUTIH)

NONEMEER 94.495 .396 .196 .195 .994 .086 .968 .549 .941 .036 .836 .036 .534 .234 .338 .347 .162 .769 .764 .267 .776 .184 .490 .0 MARCH $\quad 90.191 .291 .592 .192 .590 .281 .264 .249 .941 .336 .434 .436 .436 .636 .538 .649 .561 .866 .964 .966 .272 .179 .183 .6$ MAY • $\quad 92.293 .394 .494 .994 .792 .384 .770 .856 .447 .240 .439 .240 .438 .036 .637 .445 .254 .261 .760 .361 .768 .476 .784 .8$ SEPTEMBER $92.994 .495 .596 .296 .193 .8 \quad 86.967 .949 .942 .636 .334 .135 .533 .833 .336 .544 .757 .464 .262 .266 .472 .279 .384 .0$ ExIEIT OF UREMIIZAIIOI
$100,000 t 94.194 .995 .295 .695 .794 .287 .369 .053 .243 .738 .134 .432 .432 .432 .336 .446 .362 .368 .867 .368 .875 .082 .386 .7$ OTH. SMSA $92.593 .493 .994 .394 .393 .085 .567 .446 .736 .330 .529 .130 .729 .429 .933 .743 .455 .663 .260 .263 .369 .176 .8 \quad 83.1$ NON-SHSA $93.094 .395 .695 .895 .793 .185 .6 \quad 67.851 .043 .838 .938 .340 .337 .637 .039 .647 .560 .6 \quad 67.162 .766 .7 \quad 74.582 .487 .8$ SECTICN OF COUNIRY

WEST $\quad 93.293 .994 .795 .095 .193 .486 .467 .250 .641 .133 .631 .432 .631 .631 .336 .045 .259 .165 .5 \quad 63.067 .175 .983 .388 .4$
 N EAST 93.094 .995 .596 .096 .394 .988 .772 .252 .843 .236 .936 .035 .432 .533 .537 .347 .960 .565 .262 .564 .370 .378 .383 .6 SOUTH 94.795 .495 .996 .296 .193 .686 .265 .848 .642 .038 .337 .838 .938 .438 .339 .945 .260 .570 .368 .772 .478 .184 .7 99.7 SEX OF RESPOLOEIT

MALE $\quad 90.391 .692 .793 .193 .190 .079 .455 .435 .629 .326 .225 .527 .124 .123 .224 .734 .350 .560 .258 .262 .069 .978 .284 .3$ FEMLE $\quad 95.696 .697 .297 .597 .596 .291 .779 .063 .8 \quad 53.646 .444 .344 .844 .144 .549 .057 .168 .272 .467 .770 .476 .683 .8 \quad 88.6$ AGE OF RESPCIDENT

18 -24 YR 91.493 .995 .296 .596 .493 .786 .168 .048 .137 .530 .328 .828 .226 .428 .429 .937 .752 .359 .754 .856 .061 .871 .479 .6 $25-44$ YR $92.593 .794 .794 .894 .892 .583 .762 .544 .036 .231 .7 \quad 29.430 .330 .030 .533 .742 .855 .962 .8 \quad 57.361 .970 .379 .1 \quad 84.9$ $45-64$ YR $94.295 .496 .096 .596 .494 .6 \quad 87.6 \quad 67.648 .640 .835 .734 .737 .133 .231 .435 .346 .562 .170 .168 .470 .176 .883 .388 .4$ $65-97$ YR 94.494 .494 .694 .894 .793 .892 .890 .280 .771 .365 .265 .763 .860 .958 .563 .068 .574 .878 .377 .581 .485 .191 .093 .5
93.194 .395 .195 .595 .493 .385 .967 .950 .642 .236 .935 .536 .534 .734 .537 .646 .459 .966 .663 .266 .573 .581 .286 .6

TABLE C-2. \% of TIME IN AURAL COTHINICATION BY HOUR (WEEKDAYS)


DAY OF HEEX

```
MON-THRU 5.4 2.1 .9.9.4 .4 .6 1.4 7.0 12.1 10.9 10.4 11.0 12.4 15.6 12.8 12.6 14.2 17.9 26.4 35.3 39.8 45.4 45.2 32.1 13.5 FRIDAY \(3.81 .6 \quad .2 \quad 0 \quad .7 \quad 2.8 \quad 7.211 .0 \quad 7.9 \quad 8.0\)
``` IITERUIEN IWUE (PRIMARY MUIIH)
```

NONEMBER 6.3 2.8 1.0 .3 3 .4 1.8 6.9 11.5 9.9 9.8 9.9 11.4 14.6 10.9 11.3 12.9 17.1 26.8 36.3 39.3 44.6 44.8 33.7 15.2
MARCH .
MAY 3.6 1.1 1.0 . .9 1.1 2.3 5.7 12.0 8.8 10.8 10.3 11.7 14.5 14.1 10.8 10.5 15.0 22.0 27.7 31.2 36.3 37.1 26.1 12.8
SEPTEMBER 4.4 1.5 . 3 . .2 . . 5 1.6 7. 7.2 12.4 11.0 10.3 10.5 11.2 14.8 12.4 12.1 13.4 15.8 25.1 32.9 37.9 44.8 45.3 33.5 14.2

```
EXIETT OF LRRASIZATIOI
 OTH. SMSA 5.1 1.7 1.6
 SECTIOL OF COUNTAY

SEX OF RESPAIOENT

```

FEMALE 5.9 2.4 .6 . . 3 . 8 2.2 7.8 14.0 13.2 13.3 13.8 14.9 18.0 16.5 16.5 18.1 20.4 28.6 36.0 38.9 45.4 44.6 31.4 14.2
AGE OF RESPGIOEII

```


TABLE C-3. PERCENT OF TIME SLEEFING BY HOUR_CHEEKOAYS)


DAY OF HEEK

 IRTERVIEW SHME (PRIHARY MWNIH)



 EXIENT OF URBAIIZATICN


 SECTICH OF COUNIRY



 SEX OF RESPGIOEII

MALE \(\quad 83.988 .490 .891 .990 .779 .851 .023 .413 .0 \quad 8.0\)
 AGE OF RESPDTOEIT
 25-44 YR 83.889 .892 .693 .992 .683 .751 .221 .111 .6

 IOTAL SATPLE


DAY OF HEEX
SATURDAY 86.488 .690 .491 .791 .891 .087 .882 .673 .662 .755 .352 .752 .049 .449 .151 .456 .760 .361 .461 .161 .465 .471 .174 .8 SLHPAY 84.086 .589 .390 .691 .391 .189 .786 .580 .068 .957 .753 .056 .256 .955 .655 .258 .763 .364 .766 .071 .377 .482 .786 .9 IITERUIO SHWE (PRIHARY MUNTHL
NONEMBER 84.488 .491 .693 .093 .993 .891 .488 .079 .767 .560 .655 .156 .055 .655 .258 .863 .767 .669 .269 .573 .478 .785 .990 .4 MARCH 85.487 .490 .191 .692 .191 .890 .486 .078 .467 .957 .154 .156 .556 .254 .854 .459 .663 .965 .964 .967 .672 .076 .779 .9 MAY \(\quad 85.187 .389 .089 .990 .289 .786 .281 .774 .463 .654 .851 .651 .949 .649 .251 .554 .859 .259 .660 .562 .868 .274 .178 .5\) SEPTEMBER 86.087 .889 .991 .791 .290 .488 .285 .476 .464 .555 .149 .851 .452 .551 .649 .453 .756 .858 .162 .265 .871 .476 .580 .9 EXIENT OF URBAIIZATIOI
\(100,000+83.186 .189 .091 .391 .791 .988 .984 .076 .166 .758 .656 .055 .953 .254 .255 .358 .361 .762 .864 .167 .072 .376 .479 .9\) OTH. SHSA 82.485 .788 .390 .090 .790 .688 .484 .477 .164 .456 .150 .752 .454 .051 .950 .255 .860 .259 .961 .362 .667 .173 .579 .7 NON-SMSA 87.188 .890 .891 .591 .791 .088 .884 .877 .066 .055 .852 .454 .152 .951 .853 .758 .262 .564 .464 .267 .672 .778 .481 .8 SECTION OF COUNTRY

WEST \(\quad 83.886 .890 .391 .091 .991 .388 .483 .474 .263 .855 .852 .551 .650 .048 .949 .455 .760 .163 .263 .866 .073 .278 .881 .9\) N CENTRAL 83.286 .088 .289 .589 .989 .587 .183 .675 .163 .655 .250 .252 .352 .452 .854 .558 .263 .564 .264 .467 .271 .075 .380 .2 N EAST \(\quad 87.089 .392 .194 .294 .794 .292 .186 .979 .769 .860 .757 .656 .954 .554 .155 .360 .363 .763 .061 .963 .867 .473 .378 .0\) SOUTH \(\quad 87.388 .790 .091 .191 .090 .788 .685 .078 .667 .255 .752 .956 .155 .553 .353 .456 .859 .861 .863 .667 .473 .379 .782 .9\) SEX OF RESPOLOENT

MALE \(\quad 82.985 .488 .189 .490 .089 .586 .380 .571 .360 .552 .449 .250 .850 .849 .550 .554 .460 .060 .562 .165 .469 .874 .879 .1\) FEMALE \(\quad 87.189 .391 .392 .692 .892 .490 .787 .981 .570 .359 .955 .856 .955 .254 .855 .760 .463 .365 .364 .867 .272 .878 .782 .4\)

\section*{AGE OF RESPGTOEAII}

18-24 YR 72.276 .381 .084 .486 .186 .483 .479 .674 .466 .858 .649 .842 .942 .340 .038 .640 .848 .251 .853 .351 .353 .960 .569 .2 \(25-44\) YR 81.184 .387 .389 .289 .689 .186 .982 .674 .662 .151 .748 .949 .147 .548 .350 .255 .360 .059 .059 .063 .669 .074 .679 .0 \(45-64\) YR 91.993 .093 .693 .893 .793 .490 .785 .676 .464 .755 .352 .657 .056 .455 .056 .561 .963 .867 .967 .669 .375 .581 .784 .8 \(65-97\) YR 95.396 .097 .297 .296 .996 .495 .894 .188 .177 .769 .566 .473 .073 .568 .668 .571 .776 .476 .076 .780 .985 .988 .989 .5

\section*{IOTAL SATPLE}
85.287 .589 .991 .191 .591 .188 .784 .676 .865 .856 .552 .854 .153 .252 .453 .357 .761 .863 .163 .666 .471 .476 .980 .9
table c-5. \% of time in aural catilnicatiau by hour (heekenos)


DAY OF HEER

 IIIERUIEH IWXE (SRIIARY MUIIII)



SEPTEPBER \(9.4 \quad 4.5 \quad .9 \quad .6 \quad .81 .5 \quad 2.4 \quad 7.411 .614 .616 .815 .220 .523 .221 .420 .423 .724 .431 .739 .442 .739 .324 .312 .9\) EXIENT OF URBAIIZAILIGI


 SECTICLI OF COUNIAY
 N CENIRAL \(9.950 .0 \quad 2.21 .1\)
 SOUTH \(\quad 5.5 \quad 3.31 .4 \quad .6\). 6 SEX OF RESPCHOEII
 AGE OF RESPDIOEIII
 25-44 YR 8.7 4.8 2.3 1.2 1.0 1. 6

 IOIAL SMPLE

\begin{tabular}{|c|c|}
\hline SUBGROUP & HUUR UE THE CAI \\
\hline & \\
\hline
\end{tabular}

DAY OF HEEK

 INTERUIEN IWNE (PRIMARY MUITHI)




EXIENT OF URRAIIzATICII


 SECTION OF COUNIRY
 AGE OF RESPQIOEII






DAY UF HEEK
 FRIDAY 92.39
IIIERUIEH IWVE (TRIIMRY MUIIH)
 MARCH \(\quad 90.291 .491 .792 .292 .891 .687 .0\) i4.0 56.346 .241 .238 .342 .139 .741 .446 .257 .271 .573 .670.
HAY 92.494 .294 .695 .095 .094 .389 .379 .961 .852 .141 .614 .316 .043 .641 .842 .753 .364 .170 .467 .766 .072 .580 .588 .8 SEPTETEER 93.794 .795 .996 .396 .395 .091 .978 .856 .247 .039 .638 .842 .238 .638 .643 .854 .568 .872 .670 .271 .676 .282 .686 .5 EXIEII UF UREAIIZATIOLI
\(100,000+94.795 .195 .598 .096 .19 .376 .673 .472 .879 .085 .489 .9\)
OTH. SISA 92.993 .694 .294 .594 .494 .691 .776 .555 .140 .433 .833 .136 .733 .035 .442 .252 .764 .074 .170 .568 .973 .281 .385 .4 NUT-StISA 93.594 .995 .796 .095 .994 .590 .478 .656 .548 .442 .443 .447 .642 .842 .346 .757 .271 .075 .169 .070 .979 .085 .390 .1 SECTIGI OF COURIRY

HEST \(\quad 93.894 .394 .895 .235 .694 .891 .578 .257 .1 \quad 46.636 .536 .611 .337 .236 .942 .754 .969 .573 .569 .871 .379 .9 \quad 86.490 .3\) I Celtipal
N EAST 93.595 .496 .096 .296 .496 .092 .781 .360 .447 .440 .740 .542 .836 .438 .245 .457 .671 .375 .070 .169 .175 .181 .196 .9 SOUTH 95.095 .795 .996 .596 .295 .391 .778 .551 ,
SEX OF RESFUTOEIT
HKLE \(\quad 90.992 .393 .193 .593 .492 .386 .769 .241 .733 .028 .729 .833 .627 .727 .239 .744 .062 .769 .964 .966 .774 .682 .087 .4\) FEFALE \(\quad 96.096 .897 .397 .697 .697 .194 .986 .870 .658 .951 .149 .5 \quad 52.049 .7\)
AGE OF RESPGTOEVII
\(18-24\) YR 92.494 .395 .896 .696 .695 .691 .279 .754 .641 .034 .332 .635 .830 .432 .539 .449 .464 .171 .264 .261 .266 .975 .283 .7 25-44 YR \(93.294 .494 .895 .095 .194 .189 .874 .650 .740 .434 .8 \quad 33.736 .531 .436 .042 .052 .868 .072 .165 .066 .975 .282 .987 .7\) \(45-64\) YR 94.695 .696 .296 .896 .595 .892 .979 .355 .046 .039 .440 .144 .038 .437 .241 .756 .372 .977 .475 .474 .380 .486 .490 .9 65-97 YR 94.494 .494 .894 .894 .894 .393 .492 .186 .276 .270 .371 .972 .666 .263 .168 .974 .260 .782 .881 .883.

\section*{TOTAL SAMPLE}

table c-8. \% aurally cuntuicate some during huyr (neekliss)


DAY OF HEEX

 IITIERUIEN HYIE (PRIIMRY MUTIII)



 EXIEII OF UREAIIZAIIITI


 SECTIOH OF COUNRY



 SEX OF RESPAIOEIT

 AGE DF RESPGTOEII







\section*{DAY OF HEEK}
```

MON-THRU 87.0 92.0 94.2 94.9 94.3 89.4 67.8 34.1 15.9 9.3 6.2 4.3 5.7 7.7 8.3 7.2 5.9 5.9 4.7 4.2 4.9 7.0 19.3 46.1 74.9
FRIDAY 86.3 90.6 92.9 94.2 92.9 84.8 59.9 27.7 12.7 6.7 4.3 3.1 3.5 4.5 3.9 4.9 3.9 3.1 3.4 3.5 5.0

```
IINIERUIEW IGNUE (PRIHARY MUNTH)
```

NONEMBER 87.1 92.3 94.4 95.5 94.6 88.7 65.8 32.5 14.8 8.2 5.7 3.7 5.2 7.4 7.4 6.7 5.0
HARCH 85.3 89.1 90.7 91.4 90.9 84.8 63.7 31.9 13.2 7.8 4.6 4.2 4.5 5.8 6.5 4.6 4.3 3.2 3.6 2.9 6.1 17.5 47.0}744.
MAY 86.7 91.4 92.9 93.5 92.8 88.2 63.7 32.0}15.3 11.1 8.2.2 5.1 6.5 8.8 10.6 8.5 4.1 3.9 3.7 4.8 6.6 16.3 45.0 72.0
SEPTEMBER 87.0 91.9 94.7 95.4 94.5 89.0 67.2 32.8 16.0

```
EXIENT UF UREAIIZATION
\(100,000 t 85.092 .593 .995 .194 .188 .567 .034 .619 .110 .1 \quad 6.1\)
OTH, SMSA \(85.990 .292 .893 .593 .189 .067 .232 .614 .9 \quad 8.1\)

SECTICI OF COUNIRY

N CENTRAL 84.189 .892 .893 .793 .087 .366 .635 .516 .3 9.9 9.9 .9


SEX OF RESPOLOENI

MALE \(\quad 85.489 .691 .792 .392 .085 .261 .228 .915 .1\) 9.4 7.0
 AGE OF RESPAOSEII







\section*{DAY OF HEEK}

SATURLAY 87.489 .491 .291 .992 .391 .790 .086 .078 .467 .861 .858 .859 .554 .854 .657 .863 .867 .668 .966 .265 .068 .973 .777 .9 SLNDAY 84.987 .490 .291 .091 .491 .790 .489 .081 .177 .051 .959 .365 .463 .260 .760 .365 .069 .170 .671 .075 .181 .485 .589 .3 IITERUIEN IWNE (FRIHARY MUIHH)

NONEMBER 85.590 .092 .493 .194 .394 .892 .789 .484 .675 .268 .761 .264 .761 .359 .763 .270 .973 .775 .474 .076 .282 .988 .693 .2 MARCH 86.289 .491 .192 .192 .492 .191 .489 .381 .673 .963 .259 .165 .361 .460 .359 .866 .270 .572 .669 .371 .074 .879 .283 .0 HAY 85.887 .989 .590 .090 .590 .488 .484 .579 .270 .962 .058 .459 .656 .054 .757 .861 .466 .066 .166 .567 .072 .477 .080 .8 SEPTEIBER 87.688 .590 .991 .791 .791 .389 .689 .383 .069 .962 .257 .460 .158 .256 .255 .860 .162 .965 .667 .069 .876 .579 .184 .2 EXIENT OF URRAIIZATIOII
\(100,000+84.387 .490 .591 .891 .992 .590 .886 .580 .572 .864 .461 .762 .8\) 58.3 \(59.160 .165 .068 .569 .068 .870 .175 .779 .8 \quad 83.8\) OTH. S115A 83.686 .788 .990 .291 .190 .989 .787 .282 .270 .865 .857 .061 .360 .856 .957 .162 .665 .268 .666 .965 .271 .277 .382 .6 NOH-SNSA 87.889 .591 .491 .792 .191 .890 .188 .081 .273 .062 .058 .862 .858 .757 .459 .464 .869 .570 .469 .271 .976 .580 .584 .0 SECTICI OF COUNIRY

HEST \(\quad 84.888 .291 .291 .292 .291 .999 .985 .478 .770 .162 .058 .259 .055 .053 .755 .963 .067 .070 .469 .369 .276 .482 .284 .6\) N CENTRAL 84.487 .089 .289 .790 .290 .188 .986 .780 .070 .562 .057 .261 .858 .958 .560 .565 .369 .570 .669 .371 .575 .178 .283 .2
 SOUTH 87.989 .090 .591 .591 .591 .589 .987 .882 .374 .362 .158 .764 .760 .658 .559 .563 .066 .568 .367 .771 .376 .982 .184 .8 SEX OF RESPQIOESII

MALE \(\quad 83.986 .688 .889 .790 .590 .688 .384 .275 .966 .953 .654 .959 .055 .054 .156 .061 .165 .366 .965 .669 .173 .177 .682 .5\) FEHRLE 87.990 .092 .292 .892 .992 .791 .890 .385 .777 .166 .562 .565 .461 .560 .661 .667 .170 .072 .170 .370 .977 .081 .484 .6 AGE OF RESPCIOENT

18-24 YR 73.577 .483 .481 .886 .487 .185 .082 .077 .870 .265 .555 .143 .147 .245 .345 .348 .956 .058 .958 .953 .758 .665 .073 .6 \(25-44\) YR 82.585 .588 .589 .690 .183 .988 .585 .179 .269 .058 .655 .757 .654 .553 .956 .662 .167 .165 .764 .568 .373 .377 .282 .1 \(45-64\) YR 92.293 .593 .693 .993 .993 .692 .489 .881 .271 .862 .557 .363 .862 .259 .561 .767 .970 .074 .972 .572 .779 .584 .187 .1 \(65-97\) YR \(95.996 .497 .297 .297 .196 .796 .396 .393 .186 .376 .471 .182 .376 .973 .973 .178 .380 .981 .279 .683 .8 \quad 87.390 .790 .5\)



DAY OF HEEK

 INTERUIEN HKNE (FRIIMRY MUIIH)



 EXIENT OF UREAIIZATIOH


 SECTIOI OF COUNTRY



 SEX OF RESPQMOEIT

 AGE OF RESPOTOEII







DAY OF HEEK

 IMIERUIEN IHVE (PRIIMRY IMUIHI)



 ExIENT UF UREAIIZAIICII


 SECTICL OF COUNIRY



 SEX OF RESPIUTOEIT

 AGE OF RESPOTOEII



 IOTAL SAIPLE

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Juster, F.T; Courant, P.; Duncan, G.J.; Robinson, J.P.; and Stafford, F.P.: 1978, Study Description: Time Use in Economic and Social Accounts (SRC Study 466041). Institute for Social Research, April, 1978.

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Second Survey of Aircraft Noise Annoyance Around London (Heathrow) Airport, 1971. Her Majesty's Stationery Office, London.

Table I. Distribution of Interviews by Day of Week and Study Wave
\begin{tabular}{|c|c|c|c|c|c|}
\hline Study Wave & \multicolumn{5}{|c|}{Diary Day} \\
\hline & Monday Thursday & Friday & Saturday & Sunday & TOTAL \\
\hline Wave 1 (OctoberNovember) & \[
{ }_{(594)}^{61 \%} 44 \%
\] & \[
\int_{(134)} 28 \%
\] & \[
{ }_{(54)} 5 \%
\] & \[
{ }_{(193)}^{20} 20 \%
\] & \[
\begin{aligned}
& 100 \% \\
& (975)
\end{aligned}
\] \\
\hline Wave 2 (FebruaryMarch) & \[
{ }_{(154)} 11
\] & \[
\begin{aligned}
& 9 \\
& (89)
\end{aligned}
\] & \[
38
\]
\[
(367)^{38}
\] & \[
{ }_{(354)^{37}} 36
\] & \[
\begin{aligned}
& 100 \% \\
& (964)
\end{aligned}
\] \\
\hline \begin{tabular}{l}
Wave 3 \\
(May-June)
\end{tabular} & \[
\left.\right|_{(170)} 12
\] & \begin{tabular}{l}
3 \\
(27)
\end{tabular} & \[
{ }_{(409)^{43}} 42
\] & \[
{ }_{(337)^{36}} 35
\] & \[
\begin{aligned}
& 100 \% \\
& (943)
\end{aligned}
\] \\
\hline Wave 4 (September) & \[
{ }_{(449)} 33
\] & \[
{ }^{25} \text { (231) }^{48}
\] & \[
{ }^{16_{(145)}} 15
\] & \begin{tabular}{l}
\[
10
\] \\
9 \\
(91)
\end{tabular} & \[
\begin{aligned}
& 100 \% \\
& (916)
\end{aligned}
\] \\
\hline TOTAL & \[
(1367)^{100 \%}
\] & \[
(481)^{100 \%}
\] & \[
(975)^{100 \%}
\] & \[
(975)^{100 \%}
\] & (3798) \\
\hline
\end{tabular}


Figure 1: Average time (percentage) at home and in two activities(at home) on weekdays (Monday - Friday)


Figure 2: Average time (percentage) at home and cumulated for two activitics (at home) on weekdays (Monday - Friday)


Figure 3: Average time (percentage) and total numbers of people (percentage of respondents) at home and in two activities (at home) (on weekdays)


Figure 4: Average time (percentage) at home and in two activities (at home) on weekends (Saturday-Sunday)


Figure 5: Average time (percentage) at home on four types of days


Figure 6: Average time (percentage) engaged in aural communication on four types of days


Figure 7: Average time (percentage) sleeping on four types of days


Figure 8: Average time (percentage) at home for each survey wave


Figure 9: Average time (percentage) engaged in aural communication for each survey wave


Figure 10: Average time (percentage) sleeping for each survey wave


Figure 11: Average time (percentage) at home for males and females


Figure 12: Average time (percentage) engaged in aural communication for males and females


Figure 13: Average time (percentage) sleeping for males and females


Figure 14. Average time (percentage) at home for four age groups


Figure 15. Average time (percentage) engaged in aural communication for four age groups


Figure 16. Average time (percentage) sleeping for four age groups


Figure 17. Average time (percentage) at home for areas which differ in urbanization


Figure 18. Average time (percentage) engaged in aural communication for areas which differ in urbanization


Figure 19. Average time (percentage) sleeping for areas which differ in urbanization


Figure 20. Average time (percentage) at home for four sections of the country


Figure 21. Average time (percentage) engaged in aural communication for four sections of the country


Figure 22. Average time (percentage) sleeping for four sections of the country
\begin{tabular}{|c|c|c|c|}
\hline 1. Report No. NASA CR-177937 & \multicolumn{2}{|l|}{2. Government Accession No.} & ent's Catalog No. \\
\hline \multicolumn{3}{|l|}{\multirow[t]{2}{*}{\begin{tabular}{l}
4. Title and Subtitle \\
The Timing of Noise-Sensitive Activities in Residential Areas
\end{tabular}}} & 5. Report Date July 1985 \\
\hline & & & 6. Performing Organization Code \\
\hline \multicolumn{3}{|l|}{7. Author(s) James M. Fields} & 8. Performing Organization Report No. \\
\hline \multicolumn{3}{|l|}{\multirow[t]{3}{*}{9. Performing Organization Name and Address The Bionetics Corporation 20 Research Drive Hampton, VA 23666}} & 10. Work Unit No. \\
\hline & & & \multirow[t]{3}{*}{\begin{tabular}{l}
11. Contract or Grant No. NAS1-16978 \\
13. Type of Report and Period Covered Contractor Report
\end{tabular}} \\
\hline & & & \\
\hline \multicolumn{3}{|l|}{\multirow[t]{2}{*}{\begin{tabular}{|ll|}
\hline 12. Sponsoring Agency Name and Address & \\
National Aeronautics and & FAA \\
Space Administration & Office of Envir. and \\
Washington, DC 20546 & Energy, Wash., DC 20591 \\
\hline
\end{tabular}}} & \\
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\hline \multicolumn{4}{|l|}{\multirow[t]{2}{*}{\begin{tabular}{l}
15. Supplementary Notes \\
Langley Technical Monitor: Clemans A. Powe11
\end{tabular}}} \\
\hline & & & \\
\hline \multicolumn{4}{|l|}{\begin{tabular}{l}
16. Abstract \\
Data from a 1975-76 nationally representative survey of time-use have been analyzed to provide estimates of the percentage of the population which is engaged in noise-sensitive activities during each hour of the day on weekdays, Fridays, Saturdays and Sundays. Estimates are provided of the percentage engaged in aural communication activities at home, sleeping at home, or simply at home. The day can be roughly divided into four noise sensitivity periods consisting of two relatively steady state periods, night ( 2400 to 0500) and day (0900 to 1600 ), and the early morning and evening transition periods. Weekends differ from weekdays in that the morning transition period is one hour later and the numbers of people engaged in aural communication during the day at home are approximately one-half to three-quarters greater. \\
The extent and timing of noise-sensitive activites was found to be similiar for all parts of the United States, for different sizes of urban areas, and for the three seasons surveyed (September through May). The timing of activity periods does not differ greatly by sex or age even though women and people over 65 are much more likely to be at home during the daytime.
\end{tabular}} \\
\hline \multicolumn{4}{|l|}{\begin{tabular}{l|l} 
17. Key Words (Suggested by Author(s)) \\
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