Influence of Location on Attitudes to Noise

K. Attenborough & S. E. Clark

The Open University

1. Introduction

In social surveys which attempt to relate the general annoyance of the population with particular noise sources characterised by selected noise units, the main problems stem from the wide variation in individual attitudes, which may or may not depend upon the noise exposure. Particular instances of this are to be found in the work leading to the postulation of the Traffic Noise Index (1) and in the London Airport Study (2, 3). Individual attitudes may correlate to a number of factors including socio-economic class, psychological constitution (4), ability to control the noise environment, and opinions concerning the effects and context of the noise (5).

The simplest model interaction that may be assumed is that the individual variation is superimposed upon a mean reaction to a given noise level and mix. There is some evidence that noise mix (i.e. variety of sources) and the relative levels are important as well as the overall ambient level, possibly because of interaction between annoyances due to separate sources within the mix. This affect would be location-based. However the reaction may be more complex involving both the short-term and long-term history of an individual's noise exposure and his or her individual sensitivity to noise.

It is to be expected that an analysis of attitude by type of location of respondent would reflect both noise level and mix and general psychological factors. In the survey analysis presented here we demonstrate principally the influence of type of location on attitudes to and general annoyance due to noise for a special population of 2 000 Open University students.

2. Content and context

In connection with their studies of noise (6, 7) in 1972, the students were asked to complete two questionnaires on their attitudes to noise and to carry out a number of measurements of major noise sources and background levels in their locality. An object of the questionnaires was to establish whether the students were sensitised through studying material connected with noise and the questionnaires were issued accordingly. The results presented here are of the second questionnaire. Comparisons with the earlier questionnaire and results of the background measurements together with a discussion of their accuracy will be given elsewhere.

The questionnaire contained questions pertaining to

(i) general attitudes to noise while studying;

(ii) sources of noise in their immediate environment;

(iii) the effects of these noise sources;

(iv) the level of the noises heard (measured using Open University CS15C Sound Level Indicators (7)).

The questions under (i) included six used by McKennell (2), one of which was an indicator of general annoyance with noise. Others related to specific noise sources. Questions under (ii) and (iii) enabled determination of the most annoying source for each student and the extent of the annoyance. Additional questions probed the type of locality of the respondent, and a limited range of personal details such as sex, age, length of residence in a particular locality, etc.

Before reporting analysis of responses we must point out that in no measure do we claim the student population surveyed to be representative of the general population. In particular there are differences in distributions of occupation, age range, sex and region.

With regard to other psycho-social factors, it may be argued that the students taking part in this survey are relatively well informed (compared with the general population) on the subject of noise. Furthermore they are comparatively well able to rationalise their experiences in a consistent and objective manner.

3. Most disturbing source

From a classification by respondent's age, of the source selected from various categories as the most annoying (irrespective of area) it would appear that children rate highly as an annoyance source to 26-50 year olds. This is to be expected as many of these students will have young families. However road traffic seems to be the main (mechanical) environmental noise source. It will be noticed that road traffic noise is rated marginally higher by students in the ranges 21-25 and 51 and above who are less likely to have young, noisy families about the home. When the noise of children is not taken into account there is a ranking of other environment sources - (i) road traffic, (ii) aircraft, (iii) mowers - which is common to all age groups. The relatively remarkable showing of mowers might be attributable to the season (spring/summer) of the survey. The Chi-square test of difference between age distribution and most annoying source distribution revealed $\chi^2 = 52.4801$ on 36 degrees of freedom which is only significant at the 10% level. However differences between the younger or older age groups and the rest of the sample are statistically significant.

4. Influence of locality on most disturbing source

Comparative analysis of the most bothersome source stated with type of area categories (7) gives support for other findings that the percentage of people annoyed by traffic noise is larger for urban than for rural areas (10). Furthermore aircraft noise was

relatively less important in urban areas than in others, as were the other noise sources compared with traffic noise. This lends some support to the hypothesis that a high level of background noise due to road traffic reduces annoyance due to other intermittent sources (9, 3 p.41). It should however be pointed out in the absence of any control over the situation of the students that the same result would follow from the noise pattern due to airports affecting more people living in rural areas than in other area types.

The survey does not seem to provide any support for the considerable attention paid to industrial noise as a source of annoyance in current and proposed legislation (11). Although industry did feature as a cause of nuisance it was not a major one judging by overall numerical response. Of course, if industrial noise was an intense cause of bother in just a few locations it would not so be shown in this survey.

There is no significant difference (or similarity) between the source profiles for rural and suburban areas. However this may be due to the smallness of the samples. Significant difference at about the 5% level is noticeable between the profiles for urban and predominantly residential urban areas. A similar difference, but this time significant at about the 5% level or better, lies between profiles for rural and suburban area.

5. Influence of location on general annoyance and attitudes

Responses to the sentiment 'Noise is one of the biggest nuisance of modern times' were tabulated against the proximity of the subject to a motorway.

From analysis it appears that those students living within 5 minutes walk of a motorway or trunk road seem to be more opinionated that (on average) they agree more strongly with the sentiment. Furthermore there seems to be a significant difference in attitudes between this group of students and the other groups.

The questionnaire enabled differentiation between students living on various types of road as well as their varying distances from motorways or major trunk roads. From this it may be concluded that traffic noise from a local main road or motorway is dominant among environmental noise sources. It is possible to hypothesise further that road traffic noise is most annoying when imposed on an area with an otherwise low background level.

There seems to be no significant difference in noise annoyance between those students living in the middle of a housing estate or on a minor through road. Respondents living in a cul-de-sac are not readily differentiable on the basis of proximity to a motorway or major road.

There seems to be a clear difference in general annoyance between those students living on a busy main road and the rest of the respondents. Furthermore there is some evidence that, for those living on a minor through road, proximity to a major road is connected with an increase in annoyance.

6. Conclusion

From the data collected from Open University students while studying, there emerge a number of relationships between type of location with respect to sources of environmental noise and attitudes to noise. Although the student group is not typical

of a general population, it is likely that they are more diverse than a student group from a conventional university. The authors consider that the survey constitutes qualitative evidence of a general relationship between attitudes to noise, noise annoyance and local environment. This will involve noise mix, noise level and various psycho-social factors. This result is of particular significance in the field of planning (12). Furthermore since many of the questions were specific to annoyance when studying, the evidence presented here suggests that cognitive abilities may be influenced by environmental noise.

Laboratories studies that attempt to isolate the effects of noise on different types of task performance might well suffer as a consequence of correlation between attitudes to noise and particular environmental background of the subjects. This would follow from a chance failure to use subjects with a randomised cross-section of home localities. This would be particularly true of ability tests that are substantially altered by motivational components. There are similar implications for social surveys that extended to the general population from a particular locality.

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