

CONSEQUENCES OF NOISE-INDUCED HEARING LOSS: EFFECTS OBSERVED IN FAMILIES

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ABSTRACT: The physical effects of noise on hearing are well understood; consequences at a personal and social level are not so evidently appreciated. Noise-induced hearing loss may be especially associated with the phenomena of, 1) reluctance on the part of the person with the injury to acknowledge hearing disabilities, and 2) misinterpretation in the family of the effects of hearing loss. These may be due in turn to, 1) fear of discrimination at work, and 2) lack of anticipated hearing problems at home. The impact of hearing injury within the family system takes the form of battles over the level of the TV, restricted social lives, and loss of intimacy within the relationship. Partners' adjustments to the effects of hearing loss suffered by a working-age spouse vary from action to achieve distance from or to minimise apparent problems, or to protect the spouse in contexts of communication difficulty.

1. INTRODUCTION

The consequences for the sense of hearing that arise from different amounts of exposure to excessive noise are well established and well known. Among several surveys, that by Burns and Robinson (1970) remains a standard work of reference on relations between noise doses encountered in different occupational settings and resulting damage to the auditory end-organ, as reflected in the increased threshold for detection of tones at different audio-frequencies.

Also well established, and reasonably well known, are the consequences of even low levels of such injury for related auditory functions, such as speech hearing in noise (Lutman & Robinson, 1992; Suter, 1978) and the detection/localization of meaningful environmental signals (Hétu, Getty & Quoc, 1995). Finally, it is evident that noise-induced hearing loss gives rise to personally experienced disabilities and handicaps, as revealed through the application of self-assessment scales (Noble, 1978).

The consequences of noise-induced hearing loss that seem to be less well appreciated are to do with the family lives of people whose hearing is affected by this aspect of the working environment. There is a body of research on that subject, aspects of which I will review in this article, but it remains relatively less well recognised than work which shows the links between physical noise 'dose', and (the average) sensory/physiological response to that dose. One can speculate that it is relatively straightforward to understand physical/physiological sorts of linkages, complex though they can be in relation to differences in temporal and spectral patterns of exposure. It may call for the exercise of more imagination for us to appreciate the ways in which a disorder of hearing, ongoingly sustained at work, manifests at home.

Interestingly and, so far as I can judge, the earliest systematic study of effects flowing on to family life, as a consequence of a member suffering noise-caused hearing

injury, was one conducted in Australia at the behest of the Deafness Foundation (Victoria) (Blaikie & Guthrie, 1984). It is consistent with my suggestion above, about the 'psychosocial' dimension being more obscure, that this study has remained outside of the usual domain of published research. It came to light during a seminar tour on Occupational Noise-Induced Hearing Loss, undertaken in November 1990 by a group comprising Louise Getty and Raymond Hétu of the University of Montreal, Dick Waugh of Worksafe Australia, and the present author. Copies of Blaikie and Guthrie's report were given to each of the four seminar presenters by representatives of the Deafness Foundation when the tour reached Melbourne.

2. BLAIKIE AND GUTHRIE'S (1984) STUDY

The starting point for this study was an extensive questionnaire-based survey of people who had gained financial compensation for occupational noise-induced hearing loss during a 28-month period. The final sample responding to the mail-out questionnaire was 313. Of these, 24 people (plus members of their families — making 60 in all) were interviewed, on the basis of several relevant criteria, not the least being a report of family difficulties associated with the claimant's hearing loss.

The interviews covered several themes, including the experience of working in noise, and the use of personal hearing protection; experiences in the family, and the extent of reliance on behavioural or technical aids to hearing. One detail highlighted by the authors was the unwillingness of participants to lodge claims for compensation before they retired, or in other ways to draw attention to any problem with their hearing, for fear of jeopardising their ongoing employment. This feature is related to one that has been noted in later research in Quebec. It constitutes a consequence of hearing loss that may be particular to this sector of the population, intensifying the more generally observed

phenomenon (e.g., Jones, Kyle & Wood, 1987) that loss of hearing gradually acquired is not a condition sufferers rush to acknowledge. Such reluctance has its own consequences for family life, as I explain later.

The principal issue for families is the stress and irritation caused by the hearing impaired person's continual requests for repetition of things said by other family members. The ongoing expression of this behaviour leads to accusations of inattention, of not caring about what is going on. A consequence is exclusion of the hearing impaired person from conversation, including avoidance of conversation with her or him by telephone (incidentally, most participants with hearing impairment in this study were males). A critical source of conflict is the volume setting of the family TV set: others in the household are continually in conflict with the person who cannot hear it properly at a level comfortable for them. Paradoxically, and partly because other noise sources are so disruptive to hearing, children's audio gear (stereo systems and the like), are complained about as being too loud for the impaired hearer to bear. As clarified in subsequent work in Quebec, the stress on the hearing impaired worker caused by the noise of other appliances in the household is also due to fatigue and irritation from being exposed to noise in the workplace all day. Peace and quiet are actively sought — the TV being, exceptionally, a source of information and entertainment.

2.1 Interpreting these findings

A force that drives much of the domestic conflict reported by the above authors is the absence of recognition that hearing loss is the most parsimonious explanation for it. Here is where the obscure nature of the problematic consequences of noise-induced hearing loss might need some imagination to recognise. Even if members of a household can 'rationally' appreciate that hearing impairment would account for the non-responses or inappropriate responses of the partner or parent in question, the emotional impact of communicative failure is not diminished. The here-and-now expectation for communicative competence overrides a 'sympathetic' reading which might be made of any specific incident. Add to this the point that reluctance to disclose impaired hearing in the context of work may well generalise to the home setting, and this can make acknowledgment of hearing loss as the cause of communication failure harder to achieve (subsequent work in Sweden bears on this issue).

An issue that lies amongst the foregoing ones is the unpreparedness of relatively youthful families (people in their 40s, for example) for the 'brutal' fact that one member is suffering a malady normally to be expected only of older-aged people. This element possibly finds support in comparative outcomes from studies in which effects of having a hearing loss are rated by both the sufferer and by their partner. In a recent analysis (Noble, in press), it was noted that certain studies comparing 'self' and 'other' ratings of difficulties due to hearing loss, have yielded somewhat contrary outcomes. Thus, a report by Chmiel and Jerger (1993) showed similar ratings by others compared with self-rating, whereas one by

Noble (1967) showed greater self-rating of difficulty compared with other's rating. One factor distinguishing the samples was the greater age of the people in Chmiel and Jerger's case. Furthermore, the people being rated had comparatively mild hearing losses, and their partners could well have had mild hearing losses also. In contrast, the sample in Noble's case was younger, and those rated had varying degrees of noise-induced hearing loss. In such cases there would be little likelihood of hearing loss in the partners. There was a low correlation between self and other's ratings of hearing difficulties in Noble's sample, a rather closer one than in Chmiel and Jerger's. The suggestion in this contrast between the samples is that rating by the other, in Chmiel and Jerger's study, might contain an element of 'empathic' self-rating, whereas the partners in Noble's study would have no personal awareness of the experience of hearing loss.

If the foregoing interpretation is plausible it suggests that hearing loss is not anticipated, during someone's working lifetime, as a feature of life in families in which one member has noise-induced hearing loss. Combined with the reluctance on the sufferer's part to acknowledge hearing loss as a fact of their own life, a consequence within the family is less likelihood that communication problems will be attributed to the state of the person's hearing, more chance that they will be perceived to arise from personal and interpersonal failings. A further factor here is that other family members do not experience the agent which is causing the injury, and there are no signs of injury to the worker in the ordinary sense of that term: no visible cuts or abrasions.

3. THE UNIVERSITY OF MONTREAL ACOUSTICS GROUP

Several aspects of the above discussion are informed by detailed studies undertaken by a research group in Quebec, headed by Hétu and Getty (Hétu & Getty, 1990; Hétu, Lalonde & Getty, 1987; Hétu, Riverin, Getty, Lalonde & St-Cyr, 1990; Hétu, Riverin, Lalonde, Getty & St-Cyr, 1988). The program of work there has been to reveal the patterns of difficulty experienced by the partners of men whose hearing is affected by noise. Besides the sorts of consequences within the household identified in the Blaikie and Guthrie study, are those experienced in larger social settings. Many of the wives of the men reported the efforts they endure in social settings, having to act as interpreters for their partners, being required to be by their side at all times so that they will not be isolated or at a loss in terms of participating in conversation.

Beyond this were expressions of sadness and distress about the loss of a meaningful social life for themselves and their partners — both feel cut off from ordinary interaction just because of the continual dependence on the wife to act as interpreter, to be 'the ears' for the two of them. The sense of sorrow pervades the couple's relationship itself, and this is brought home very poignantly in the severe limits on intimate conversation at home. Such effects are not confined, of course, to people whose hearing is injured by noise (see, e.g., Hétu, Jones & Getty, 1993; Jones et al., 1987). But the 'epidemic' character of these consequences (occurring across

substantial numbers of people who work daily alongside each other), has its own paradoxical quality. The fear of discrimination at work, of being passed over for promotion, of being side-lined within the system, helps to maintain a general concealment of the fact of hearing loss. A cogent finding by Héту et al. (1990) was the hostility shown by other workers toward those who made public disclosure of hearing problems. Thus, a substantial occupational and public health problem is allowed to perpetuate in no small part because victims take no action to address the problem at source.

4. SUBSEQUENT WORK IN SWEDEN

A variety of studies of the nature of experienced handicaps has been conducted by researchers at the University of Gothenburg. One that bears especially on certain of the themes in the present paper is by Hallberg and Barrenäs (1993), detailing the types of responses engaged in by the wives of men with noise-induced hearing loss, in the face of their reluctance to acknowledge hearing difficulties. Some wives, in some contexts at anyrate, go along with the position that there is no real problem, hence the couple act in concert to maintain a view that normal conditions prevail. Others seek to minimise the impact of any communication difficulty, even where the husband will allow that a problem exists. In some contexts, the partners act as 'shields and swords' for the husband who is reluctant to acknowledge difficulty; in yet others, the wife copes, as it were, by distancing herself from the problem, leaving the husband to work out his own solutions.

These strategies for handling a problem that strikes at the basis of any human relationship may be interpreted with varying degrees of insightfulness by different researchers, and there may be a risk that victims, in some sense, are treated condescendingly in being categorised one way or another. The general point to take away from all of the studies mentioned here is that the consequences for those affected directly, and their families, are substantial and various, as well as potentially very destructive of any close personal life.

Findings like these re-emphasise the urgency of needing to address the problem of noise in the workplace. The consequences go beyond physical injury to an end-organ, pointing to corrosive effects on mental and social well-being.

REFERENCES

Blaikie, N. W., & Guthrie, R. V. (1984). *Noise and the family: An enquiry into some effects of noise induced deafness*: Faculty of Humanities and Social Sciences, RMIT.

Burns, W., & Robinson, D. W. (1970). *Hearing and noise in industry*. London: HMSO.

Chmiel, R., & Jerger, J. (1993). Some factors affecting assessment of hearing handicap in the elderly. *Journal of the American Academy of Audiology* 4, 249-257.

Hallberg, L. R.-M., & Barrenäs, M.-L. (1993). Living with a male with noise-induced hearing loss: Experiences from the perspective of spouses. *British Journal of Audiology* 27, 255-261.

Hallberg, L. R.-M., & Jansson, G. (1996). Women with noise-induced hearing loss: An invisible group? *British Journal of Audiology* 30, 340-345.

Héту, R., & Getty, L. (1990). The nature of the handicap associated with occupational hearing loss: obstacles to prevention. In W. Noble, R. Héту, R. Waugh, & L. Getty (Eds.), *Occupational noise-induced hearing loss: prevention and rehabilitation*, (pp. 64-85). Sydney; Armidale: National Occupational Health and Safety Commission; University of New England.

Héту, R., Getty, L., & Quoc, H. T. (1995). Impact of occupational hearing loss on workers' lives. *Occupational Medicine*.

Héту, R., Jones, L., & Getty, L. (1993). The impact of acquired hearing impairment on intimate relationships: implications for rehabilitation. *Audiology* 32, 363-381.

Héту, R., Lalonde, M., & Getty, L. (1987). Psychosocial disadvantages associated with occupational hearing loss as experienced in the family. *Audiology* 26, 141-152.

Héту, R., Riverin, L., Getty, L., Lalonde, N., & St-Cyr, C. (1990). The reluctance to acknowledge hearing problems among noise exposed workers. *British Journal of Audiology* 24, 265-276.

Héту, R., Riverin, L., Lalonde, N., Getty, L., & St-Cyr, C. (1988). Qualitative analysis of the handicap associated with occupational hearing loss. *British Journal of Audiology* 22, 251-264.

Jones, L., Kyle, J., & Wood, P. (1987). *Words apart: Losing your hearing as an adult*. London: Tavistock.

Lutman, M. E., & Robinson, D. W. (1992). Quantification of hearing disability for medicolegal purposes based on self-rating. *British Journal of Audiology* 26, 297-306.

Noble, W. (1967). *The assessment of disability from chronic acoustic trauma*. Unpublished MA, University of Manchester.

Noble, W. (1978). *Assessment of impaired hearing: A critique and a new method*. New York: Academic Press.

Noble, W. (in press). *Self-assessment of hearing and related functions*. London: Whurr.

Suter, A. H. (1978). *The ability of mildly hearing-impaired individuals to discriminate speech in noise* (EPA 550/9-78-100; AMRL-TR-78-4): US Environmental Protection Agency/Aerospace Medical Research Laboratory.

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