

COMMUNITY NOISE SURVEY - A REPORT

REg.No.M9217

An Independent Project work submitted in part fulfilment
for First Year M,Sc.. (Speech and Hearing to the University
of Mysore).

ALL INDIA INSTITUTE SPEECH AND HEARING, MYSORE - 57006

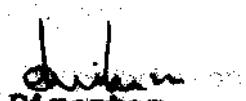
MAT 1993

**Dedicated
to my
Teacher
Mr. Antony Thomas**

CERTIFICATE

This Is to certify that the
Independent Project entitled:
Community Noise Survey - A Report
Is the bonafide work done in part
fulfilment for First Year M.Sc.,
(Speech and Hearing) of the student
with Reg.No.M9217

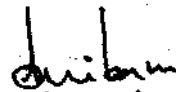
Mysore
May 1993


Director
All India Institute
of Speech & Hearing
Mysore-6.

CERTIFICATE

This is to certify that this
Independent Project entitled:
Community Noise Survey - A Report
has been prepared wider my supervision
and guidance.

Mysore...
May 1993 *Guide*


Dr. (Miss) S. Nikan

DECLARATION

I hereby declare that this Independent Project entitled: **Community Noise Survey - A Report** is the result of my own study undertaken under the guidance of Dr.(Miss) S.Nikam Prof, and Head, Department of Audiology, All India Institute of Speech and Hearing, Mysore, and has not been submitted earlier at any University for any other Diploma or Degree.

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INTRODUCTION

Life is spent in a world of competing signals, some of which are at times extremely important, and other times ignored. A sound one does not want to attend to can be regarded as a noise and a sound a person is interested in as signals. "Noise" is a complex, but fascinating area of study. "Noise" defined as a unwanted sound has been known for a long time. "James Fricke" speculated that the first noise problem may have occurred when Eve poked Adam in the remaining ribs and told him to stop snoring.

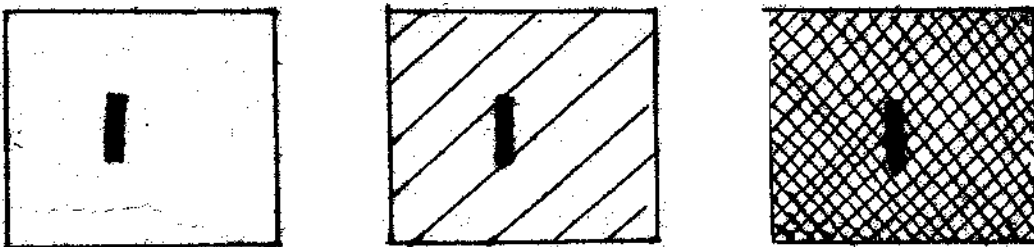
From the time of Adam to the present day modern life, the view of noise has been changing. In the name of technological progress, noise has been regarded as undesirable, but a necessary by-product. An example is the air-travel or lawn-mowers whose accompanying sound has to be tolerated to fulfil our luxuries. But where is it taking us? Are these real luxuries.

It was not until the technological revolution of the past century that unwanted sound crept into significant portions of the life of nearly every resident of civilised world. The proliferation of machines, vehicles, appliances, and aircraft has proved noise-producing devices into the

environment in ever increasing number. Today's vast technology was triggered by the industrial revolution which has proclaimed the philosophy that the machine should serve to ease human burden, unfortunately, along with it, it gave rise to noise.- A "SILENT" KILLER.

How noise works:

Noise has been classified as insidious in our environment, because its effects appear slowly. In fact, the effects of noise exposure may not become apparent until long after exposure have begun. That noise is an undesirable elements in the environment is readily apparent in the way unwanted sounds often impede the hearing of desired sounds. Fig.1 is a schematic representation of signal-to-noise concept.



All these boxes carry a signal, the number (1) The clear box shows the importance and availability of signal. The other lines is the middle box represent noise, since the noise is not too great, the signal is still quite easily

discerned. The third box indicates on Undesirable signal to noise ratio, in that the noise represented by cross matched lines, nearly obliterates the signal. However, extreme quite in the environment also can be alarming, perhaps because man has been so accustomed to a noisy world that an abrupt interruption of noise is disturbing.

But, not all levels of noise are disturbing. Different authorities have come out with different levels of damage risk criteria ie. the level beyond which noise exposure is considered harmful OSHA.

Recommends 85 dB A for 8 hours as DRC whereas ISO recommends 90 dB for 8 hours as DRC ie, beyond this level, continuous exposure results in hearing loss.

But why is noise exposure an area of such concern?

Noise affects unaccountable aspects of our lives. The word noise and nausea have the same latin root. Noise reaches into the depth of man being and disrupt the complex processes that strive to maintain physical and chemical balances in the body.

The inner ear which suffers the brunt of destructively intense sound has no pain receptors, hence no sensation skin

to the hurt felt after being cut or burned. Words or any other sounds delivered with sufficient force to the ears can until cause irreversible damage to portions of the hearing sensory mechanisms. Noise not only can be disruptive, leaving, are upset and feeling. Out of sorts, but also in obstructive to the tiny and irreplaceable sensory cells in the inner ear. The effect of noise on man can be summarised as:

* Auditory effects:

- damages the inner ear resulting in permanent hearing loss
- causes temporary hearing loss.

*Non - auditory effects:

- * As an adjunct to stressful noise exposure, the balance maintained in body's physiological operation becomes disturbed after such disturbances appear at the conscious level as feeling of annoyance, irritability, nervousness or similar sensations. Sounds in the frequency of 2000 Hz are certainly more annoying than sounds of low frequency energy (Peterson and Cross, 1972).
- * Davis et al (1955) - discussed the N-response - This syndrome includes
 - vasoconstriction and rising of blood pressure with slight elevation in heart rate.

- Slow deep breathing
- Measurable changes in skin resistance to electricity
- A variation in skeletal muscle tension.
- *Davis and Berry (1964) - Changes in digestive system has been noted.
- * Hale and Levy (1952, 1967) - Glandular activity alter the chemical content of blood and urine.
- * Dickson and Chadwick (1951) - Vestibular problems occur,
- * Jansen (1967) - Dialation of pupils occur.
- * Interferes with several reproduction functions and resistance to viral disease.
- * Produces pathological effects, like hypertrophy of adrenal glands.
- * Developmental abnormality of the fetus and brain injury.
- * Causes cognitive disorder.

Societal impact:

Human beings as social animals, depend *upon* their ability to communicate in order to function appropriately within their society. Noise interferes with both communication and performance.

When noise is present, the phenomena of masking may occur, changing the perceived quality of speech, modifying the directionality or loudness of speech or rendering the desired speech signal totally inaudible.

Educational effect:

The effect of noise on education is one of those nasty gray areas that must be considered. Specially in case of some schools that are situated in the flight-line for large airports, so that every minute of the school day, the sound of aircraft take-off or forces instructors to punctuate their presentation with silent intervals.

Psychological factors:

When an experience bears on physiological balances, it is apt to be psychologically impressive too - Noise.

- * Results in mood changes, especially frustration, irritation, vexation, fatigue etc.
- * Generally, it holds that highly nervous and irritable person -will show more distress in presence of noise.
- *Activities Which require exact precision will be more difficult in case of high noise.

Economic factors :

Compensation for noise induced hearing impairment, sometimes amount to astounding amount after is billions of dollars.

Its always better to prevent the exposure rather than going for cure. So several signs warns the danger of intense- sound to the ear structures.

- * When in the presence of high level sound, voice communication is extremely difficult or impossible, the sound level is dangerously high.
- * If on leaving a noisy environment, the ear ring or buzz, exposure has been excessive and some degree of ear damage may have occurred, -although normally, it would be very slight.
- * Some persons notice a shift in hearing sensitivity, after high intensity noise exposure. Repeated exposure may result is permanent ear damage.
- * During some episode of extreme high intensity noise exposure pain may be experienced.
- * High level sounds may cause some effects in spatial stability and steadiness, for the sound may be causing ear damage as well as disrupting the balance mechanism, as both share the same closet -The inner ear.

- * After noise exposure, some persons become highly disagreeable and tense. This nervous reaction may be caused by a sound that over time may be hazardous.
- * Some kind of intense noises result in senses headaches which here on oto-laryngering capability.

PURPOSE OF THIS SURVEY:

The main purpose of this survey was to see the variability regarding the effects of noise, and it was done to get a probable answer, . for the following questions.

1. Whether the effect of noise varies with different age groups?
2. Whether the effect of noise varies with different occupation.
3. Dose noise affect our daily living activities ? And if yes, what kinds of noise is more affected?
4. And how does it vary with different age group?

REVIEW OF LITERATURE

Many studies have been done all over the world regarding the effects of noise on the human man-kind and the result shows that noise is a "silent killer" damaging our auditory mechanism to variable degrees depending upon the time and amount of noise exposure,

Bohne, Yohman (1987) did a study on chinchillas exposing the organ of corti to both interrupted and continuous noise (HFN). Results indicated that with equal energy exposure to the high frequency noise, interrupted noise exposure produce considerably less hair cells lass than continuous exposure.

Effect seen was - Outer cell was wiped out,

- Degeneration of stria vascularis.
- Myelinated nerve fibre degeneration.
- Loss of outer pillars exceeded loss of inner pillars.

Phaneuf and Hetu (1934) conducted a pilot study in the province of quebec aad found that at least 1,00,000 workers suffer from occupational hearing loss,of the loss of sensitivity is restricted to high frequency, the workers ability to hear and converse under adverse listening condition affected.

Lindgren and Axelsson (1987) compared the effect of noise and music on hearing and concluded that sounds which are found aversive or distressing may produce more temporary threshold shifts than sounds which are found enjoyable ie, those who disliked the music had greater threshold shift than those who liked in the music group. Possible explanation given "There may be a difference in inner ear circulation on a hormonal basis, if a high sound was experienced as "beautiful music" vs, "terrible noise".

Lindgren and Axelsson - compared a group of classical musicians to age matched sample of pop musicians found that 13% of the pop musicians had hearing threshold outside the normal range when compared to 43% classical musicians.

According to a report entitled Noise in America prepared for environmental protection agency (EPA) about million American are exposed to potentially hazardous noise level on the job.

59 million people are exposed to urban traffic noise.

16 million people are exposed to aircraft noise.

31 million people are exposed to highway noise.

Whose average levels are 60 dB or above.

In a report published by the national Institute of Occupational Safety and Health rated noise induced hearing loss. It was seen that, in the military sector, exposure to excessive noise leads to serious limitation in personnels ability to perform duties and results in significant yearly compensation costs of around 170 million dollars.

Although childs as hearing sensitivity to loud noises is as yet little understood, their exposure to many types of man made noise is inevitable. In a single case study done by Belgado-Paredes and Goldstein (1987) a 12 year old boy who had regular exposure to noise sources like sport-hunting, walkman, and a 100 watt personal stereo system which he listened daily on high levels of sound for four years, developed speech discrimination problem in noise and also reported to have ringing sounds in the ears, and consequently developed a high frequency loss.

In a survey done in the Junior high school students, (1987) Virginia, Loss and Woolford/sound that student exposure to potentially dangered noise is considerable. The majority of students (67.5%) use a walkman system with earphone almost all (93.6%) listen to a stereo system, and the

majority attend dances (84.7%) and rock concerts (53%) and use power lawn movers (60.2%).

ASHA reports that animal studies have shown that extended exposure to rock 'n' roll music at 120 dB can cause irreparable damage to 25% of the cochlear sensory cells.

Clark of CZD measured the sound level of Bruce Springsteen concert, and found that it reached 100 dB over 4 hours which exceeds the federal work practice standard. According to Johnson, the noise exposure damage from one typical rock concert equals the damage of two and one half year of natural aging*

Music is not the only source of hearing damage, but even some sports can contribute a lot,

Clark showed that gunfire* can reach sometimes as high as 160 dB. He explains that the mechanism of damage depends upon different causes. If noise level is 130 dB - 135 dB - ear is damaged mechanically, cells are torn apart.

If noise level is like noise induced hearing loss - hearing loss occurs metabolically. Basal cell constrict, oxygen supply is cut off and hair cells die.

Rice, Rossi and Olina (1987) wanted to find out the damage risk with personal cassette player users and found that the risk of a hearing performance decrement following regular listening through the headphones of personal cassette player devices (If continued for ten years) has been estimated as one in 1,500 for the user population at large and is slightly more in males than in females. Same 5% of the sample are actually exposed to unobstructed field noise exposure levels greater than the currently recommended daily level of 90 dB L_{Aeq}

Turnen-rise, Flittorp and Tuete (1989) measured the equivalent sound pressure level of the music played in the personal cassette players on the KEMAR and concluded that the risk of acquiring permanent hearing loss (noise induced hearing loss) from use of personal cassette players is very small for what they found to be under normal conditions. Three conclusions were arrived at -

- * Normal exposure level of personal cassette player music for the great majority of users are lower than those implying a risk of hearing loss.
- * Music with extensive use of percussion instrument produces greater temporary threshold shift and may be more dangerous to hearing than the other types of music.

- * The noise criterion for industrial noise contain a greater margin of safety for exposure to music, due to greater variation in spectra and level and more pauses compared with industrial noise.

Prila, Sipila (1991) wanted to see the hearing asymmetry among occupationally noise exposed men and women under 60 years of age and concluded that -

- * When inter-aural symmetry was noted at 4 KHz, the left ear was statistically significantly worse than the right ear in both male and female.
- * The inferiority of the left ear at 4 KHz increased as a function of the hearing threshold level in the worse ear,
- * In a population exposed to frequent gunfire, the average inferiority of hearing in the left ear at 4 KHz was close to the average of all occupationally noise exposed males at corresponding threshold level.

Only a few studies have been done in India regarding the noise pollution:

Prabhu, Munichakraborty (1979) did a study in Calcutta, regarding the citizens perception of noise and also the causative factors. It revealed that noise ranked third in severity among six urban nuisance. It ranked immediately after the air pollution and higher than the ugliness of the visual environment.

Thiery and Meyer-Bisch (1988) did a cross-sectional epidemiological survey in a car-body workshop with 234 workers. Their hearing level were compared to those of a reference population not exposed to noise, to those of a pop exposed to quasi-steady noises at 95 dB(A). Results reveal significant hearing loss after nine years of exposure, greater than that from Quasi-steady noise exposure with the same equivalent continuous weighted sound pressure level.

Thiessen found that middle aged people are more sensitive to noise by about 15 dB and that susceptibility to sleep disturbance by noise increased with age.

Ohlström and Rylander (1989) monitored body movements at night as measure of disturbed sleep and found a close relationship for bed movements immediately following single noise peaks during nights with intermittent noise.

Carter and Beh (1981) wanted to find the effect of intermittent noise on vigilance performance and found that intermittent noise exerts effects on observers sensitivity speed of response and accuracy of response. On the contrary, Eichenbrenner has reported increased decrement on a complex psychomotor task with decreased noise predictability.

It is seen that the effect of noise depends not only on the time and amount of exposure, but also on the spectral characteristics of the noise exposed. Further it is seen from the literature that noise plays havoc not only with our auditory mechanism, but also with other daily living activities, thus disturbing the normal human physiology.

METHODOLOGY

A questionnaire was developed for collecting the information. Because the aim was to study the effect of noise on different age groups. Two questionnaires were developed separately for the children and adults. Each questionnaire had two parts. I-part consisted of ten categories and each had 9-10 sub-categories. II-part consisted of 11 daily living activities which are most probable to be affected by the noise.

Selection of categories:

Those categories of noise were taken which are generally considered to be disturbing, and an/effort was made to include all the possible noises in the environment. Because two age groups were included, categories were selected based on the kind of noise exposure of each age group.

Selection of subjects:

Subjects were randomly selected and the two age groups were:

1. Children - Age ranging from 10 to 18.
2. Adults - Age ranging from 18+ and above.

- I. Subjects were asked to tick all the noises that they felt were disturbing to them.
- II. They had to list down the noises that affect the daily activities mentioned in the questionnaire.

Distribution of the questionnaires: (Appendix A & B)

100 questionnaires were distributed. Out of which 50 was for adults and 50 for children. In case of adults, effort was made to include different occupations, so that the noise effect on different occupations could also be studied, socio-economic status was also considered.

Out of 100 questionnaires distributed 85 questionnaires were returned (Table-1 and Table-2). An analysis of these indicates the following)

Table-1: Shows the number of questionnaires given and no.of questionnaire returned by the two age groups.

Age group	No.of questionnaires	
	Given	Returned
Adult (18+)	50	45
Children(10-18)	50	40

Table-2: Shows the number of questionnaires given and returned by people of different occupation.

Occupation	No.of questionnaire	
	Given	Returned
1. Housewives	10	9
2. Doctor	8	6
3. Teachers	8	8
4. Engineers	8	7
5. Scientists	8	7
6. Factory workers	8	6

ALYSIS AND DISCUSSION

Adults

Noise made by people:

Quarelling was considered as the most disturbing noise followed by screening, snoring, crying, whistling, laughing, going up and down the stairs, singing, conversation, shuffling feet.

The least disturbing noise were those of applauding and shouting, (Ref .Table-3).

Noise made by Hawkers:

Noise made by people who buy old paper and boxes was considered as the most disturbing noise followed by noise made by vegetable and fruit vendors milkman, plastic material repairer, steel vendors, tea and coffee vendors, fish tenders and other.

Noise made by bangle vendors was considered to be the least disturbing. (Ref. Table-4).

Noise made by domestic appliances:

Boise made by the nixie and screeching of furniture was considered as the most disturbing noise. Followed by

the noise made by watertap, vessels, calling bell, pressure cooker, gate, milk cooker, television, fan and telephone.

Noise of the musical clock was considered as the least disturbing noise. (Ref.Table.5)

Noise from flour mills, factories, main road and workshops were considered as the most disturbing, followed by the noise from religions places, garage, choultry, theatres, shopping complex, railway station, discotheques, recreation clubs, educational institutions, hotels, canteen, mines, race-courses, hospitals, music and dance classes, and religious centres.

Noise from Government places, airport, and walkman were considered as minimally disturbing, while noise from gymnasium, swimming pool, stadium and sports club were not all considered as disturbing (Ref.Table-6).

Noise made public address system:

Noise from the loudspeakers were considered to be the most disturbing, followed by the advertising for lottery.

Among different kinds of music, western pop was considered to be the most disturbing, followed by rock and roll, Indian pop and Indian classical. Western classical was considered to be least disturbing.(Ref.Table.7)

Seasonal noises:

Canvassing for elections was considered to be the most disturbing noise followed by yathras and protests, public lectures, religious functions, exhibitions, circus, festivals, plays, and musical programme were considered to be the least disturbing.(Ref .Table-8)

Noise made by animals, birds and insects:

The most disturbing noise was considered to be that of the dog, followed by lizard, insects, crow and sparrow, other and cat.

Noise made by the cow and goat were considered to be least disturbing. (Ref.Table-9)

Noise made by vehicles:

Bikes without silencer were considered to be the most disturbing, followed by track, heavy duty vehicles, autorikshaw, buses and other two wheelers.

Noise from jeep cycle bells and other were considered to be the least disturbing. (Ref.Table.10).

Natural phenomena:

Thunder noise was considered to be most disturbing noise followed by storm, splashing of rains, others.

Rustling of leaves was considered as the least disturbing. (Ref,Table-10)

**ANALYSIS - Children
Part - I**

Noises made by people:

Quarelling and shouting was considered to be the most disturbing noise followed by snoring, crying, whistling, and noise created by outdoor games. The least disturbing noises were those of clapping, going up and down the stairs shuffling feet, applauding, singing and noise created by indoor games.

Table-3: Showing the number of children and adult who reported the noise made by people to be disturbing.

Kinds of noise	No.of children who reported the noise to be disturbing	No.of adults who reported the noise to be disturbing
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Noise made by people:

1. Conversation	5	7
2. Quarelling	26	25
3. Screaming/shouting	23	16
4. Crying	10	15
5. Laughing	3	10
6. Snoring	18	15
7. Clapping	2	-
8. Going up & down the Stairs	2	10
9. Shuffling feet	2	6
10. Applauding	3	2
11. Whistling	9	13
12. Outdoor game	5	-
13. Indoor game	2	-
14. Singing	2	7

Noise made by Hawkers:

Noise made by beggars was considered to 60. The most disturbing noise followed by the noise made by fish vendors, vegetable and fruit vendors, steel vessel vendors, people who buy old paper and boxes, plastic material repairer, tea and coffee vendors, bangales and other items, and icecream vendors

The least disturbing noises were those of other eatable. and milkman.

Table-4: Shows the no.of children and adults who reported the noise made by hawkers to be disturbing.

Kinds of noise	No. of children who reported the noise to be disturbing	No.of adults who reported the noise to be disturbing
Milkman	2	10
Beggars	15	
Vegetable & fruit vendors	12	12
Plastic material repairer	8	9
Tea and Coffee vendor	7	6
People who buy old paper & boxes	10	20
Bangle & other items	5	3
Fish vendors	15	7
Other eatables	3	-
Ice-cream	5	-
Others	3	-
Steel vessel vendors	11	8

Noise made by domestic appliances:

Noise made by mixie and screeching of furniture was considered to be the most disturbing following by noise made by vessels, gate, milk cooker, doors, telephone, musical clocks, fan and windows.

The least disturbing noises were those of water tap and pressure cookers.

Table-5: Shows the number of children and adults who reported the noise made by domestic appliances to be disturbing.

Name of the domestic appliances	No.of children who reported the noise to be disturbing	No of audlts who reported the noise to be disturbing
Vessels	15	11
Milk Cooker	10	7
Pressure cooker	4	10
Pan	5	6
Water tap	4	12
Gate	14	9
Door	9	9
Window	5	10
Telephone	6	4
Calling bell	9	11
Mixie	19	20
Musical clock	5	3
Screeching of furniture	20	20
Television	10	0
Stereo and deck	4	15
Others	-	1

Community noise:

Noise made by factories was considered to be the most disturbing followed by railway station, bus-stop, mines discotheques, main road and highways, workshops, playground, canteen, music and dance classes, stadium flour mills, educational institutions, hospitals, hotel and restaurants, religious places, race courses and walkman.

The least disturbing noises were noise made by swimming pools, recording centre, offices and finally gynasium.

(Table-6: Next page)

Table-6: Shows the number of children and adults who reported the community noise to be disturbing

Community noise	No.of Children who reported the noise to be disturbing	No.of adults who reported the noise to be disturbing
1. Choultry	5	8
2. Theatre	8	7
3. Shopping complex	8	7
4. Educational institution	7	6
5. Hospitals	6	5
6. Flour mills	7	17
7. Play ground	11	7
8. Garage	3	10
9. Bus-stop	16	6
10. Railway station	20	7
11. Airport	10	3
12. Main road and highway	13	17
13. Workshops	12	17
14. Library	-	mm
15. Discotheques	15	6
16. Hotel and restaurants	7	5
17. Music and dance classes	8	4
18. Recording centre	3	3
19. stadium	8	1
20. Religious places	5	10
21. Offices	3	2
22. Factories	25	17
23. Mines	16	5
24. Gymnasium	2	-
25. Swimming pool	3	-
26. sports club	1	-
27. Walkman	5	2
20. Recreation club	5	6
29. Canteen	10	5
30. Library	1	-
31. Race courses	5	5
32. Others	aw	1

Noise by public address system:

Under this category, noise from the loud speakers showed the highest score followed by advertising loteries.

Among different kinds of music, western pop was considered to be the most disturbing followed by rock 'n' roll, Indian pop, Indian classical and western classical. Indian light music proved out to be the least disturbing.

Table-7: Shows the number of children and adults who reported the noise created by public address system to be disturbing.

Name of the public address system	No.of children who reported the noise to be disturbing	No.of adults who reported the noise to be disturbing
1) Loudspeaker during marriages	30	31
2) Music -		
a) rock 'n' roll	15	10
b) western pop	15	10
c) Indian light	1	5
d) Indian classical	4	5
e) Western classical	4	1
f) Indian pop	5	7
3) Advertising Cor lottery	15	15

Seasonal noise:

Canvassing for elections was considered to be the most disturbing followed by protests and strikes, public lectures, others, exhibitions, circus, festivals, musical programmes, and fairs.

Noise made by plays and religious functions were considered to be the least disturbing noises.

Table-8: Shows the number of children and adults who reported the seasonal noise to few disturbing.

Name of the season	No.of children who reported the noise to be disturbing	No.of adults who reported the noise to be disturbing
1. Public lectures	15	12
2. Plays and dramas	3	4
3. Musical programmes	5	3
4. Festivals	7	7
5. Canvassing for elections	30	30
6. Yathras, protests	20	16
7. Religious functions	2	7
8. Exhibitions	7	7
9. Fairs	5	-
10. Others	8	1
11. Circus	7	7

Noise made by animals, birds and nests:

The most disturbing noise was considered to be that of the dog, followed by lizard, sparrow, insects and cat.

Noise made by hen and goat posed minimal disturbance or no disturbance at all.

Table-9: Shows number of children and adults who reported the noise created by animals, birds and insects to be disturbing.

Name	No of children who reported the noise to be disturbing	No. of adults who reported the noise to be disturbing
1. Dog	17	20
2. Cat	5	3
3. Cow	7	2
4. Lizard	10	11
5. Goat	1	2
6. Sparrow	7	6
7. Hen	1	2
8. Insects	6	9
9. Others	2	3

Noise made by vehicles:

Bikes without silencer were considered to be the most disturbing, followed by the noise made by truck, heavy duty vehicles, buses, cycle bells, autorickshaw, others, other two wheelers.

The least disturbing noise was that of the car and jeep.

Table-10: Shows the number of children and adults who reported the noise created by vehicles to be disturbing.

Name	No .of Children who reported the noise to be disturbing	No.of adults who reported the noise to be disturbing
1. Bikes without silencer	28	24
2. Other 2 wheelers	6	5
3. Truck	20	21
4. Jeep	4	3
5. Buses	12	10
6. Cycle bells	12	3
7. Auto rickshaw	10	11
8. Heavy duty vehicles	17	15
9. Others	6	3
10. Car	3	-

Natural:

Thunder noise was considered to be most disturbing noise followed by noise made by storm, splashing of rain and others.

Noise made by the rustling of leaves posed no disturbance at all.

Table-11: Shows the number of children and adults who reported the sounds created by the natural phenomena to be disturbing.

Natural phenomena	No. of children who reported the noise to be disturbing	No. of adults who reported the noise to be disturbing
1. Thunder	15	20
2. Splashing of rain	6	3
3. Storm	10	8
4. Rustling of leaves	1	2
5. Others	6	3

DISCUSSION - PART -I

Not much difference was found between the two age groups and most of the noises considered as disturbing by children were also considered disturbing by the adults (Ref.Tables-3 to 11).

Noise made by the people:

Both the age groups gave the highest importance to quarelling and screaming, but shouting which was considered as the least disturbing noise by adults was considered as very disturbing by the children.

Hawkwes:

Boise made by the milkman was considered as quite disturbing by the adults, but least disturbing by the children. Others noises showed the same responses.

Domestic appliances:

Both the age groups considered mixie and screeching to be very disturbing, but noise from pressure cooker which was considered least disturbing by the children, was considered te be quite disturbing by the adults.

Noise:

Both the age groups shared the same opinion of noise from factories being the most disturbing and noise from gymnasium and swimming pools to be the least disturbing.

Public address system:

Noise from loud speaker was considered as most disturbing by both the groups followed by advertisement for lottery. Regarding different kinds of music, both groups found western pop to be the most disturbing, but differed in their view about the least disturbing noise.

Children considered Indian light music to be the least disturbing noise, whereas adult considered western classical as the least disturbing.

Seasonal:

Both groups found noise from canvassing for elections to be the most disturbing, and noise from plays and musical programmes to be not very disturbing.

Animals, birds, insects:

Both the age groups shared the same view about the most disturbing and the least disturbing noise, ie, noise made by dogs was considered to be the most disturbing. Whereas noise by hen and goats was considered to be the least disturbing.

Vehicles:

Noise from bikes without silencer was very disturbing to both the groups and noise from jeep and ear posing least disturbance.

Vehicles:

Thunder noise was considered as most disturbing by both the groups and they did not differ in their opinion about the least disturbing noise also, ie. rustling of leaves was considered to be the least disturbing.

So, its seen that -

- * Most of the noises considered as disturbing were independent of the different age groups. Both age groups shared the same view about the most and the least disturbing noise.
- * Some of the activities of the adults (such as shouting) was considered as disturbing by the children, but not by adults.

ANALYSIS BASED ON DIFFERENT OCCUPATIONS

House wives:

As revealed by the housewives noise made by people was considered to be the most disturbing, followed by noise made domestic appliances, public address system, vehicles, animals, birds, and insects and hawkers, and natural phenomena.

Noise made by outside sources and seasonal noise was considered to be the least disturbing.

Scientists:

Reported that noise made by vehicles can most disturbing followed by noise from public address system, by people, seasonal, noise by outside sources and hawkers.

Noise made by animals, birds and insects, natural phenomena and domestic appliances was considered to be the least disturbing noise.

Factory worker:

Revealed that noise from public address system was the most disturbing followed by noise by vehicles, animal-birds and insects, by people and from outside sources

noise by natural phenomena, seasonal noise and noise from domestic appliances and hawkers was considered to be the least disturbing.

Engineers:

Considered noise made by vehicles as most disturbing followed by noise made by people, from outside sources, public address system and domestic appliances and animals, birds, and insects.

Noise made by natural phenomena, hawkers and seasonal noise was considered to be the least disturbing.

Teachers:

Pound noise made by people as the most disturbing noise followed by noise made by domestic appliances, public address system, outside sources, seasonal noise.

Noise by animals, birds and insects, vehicles, hawkers and natural phenomena was considered to be the least disturbing.

Doctors:

Revealed that noise made by people was the most disturbing noise followed by seasonal noise, vehicles, public

address system, domestic appliances, and from outside sources.

Noise made by animals, birds and insects, hawkers and natural phenomena was considered as the least disturbing.

CONCLUSION:

Effect of noise varied with different occupations depending upon their working environment.

- * Doctors, teachers, and housewife's found noise by people to be most disturbing.
- * Engineers, scientists and factory workers found noise by vehicles to be the most disturbing.

There was a general opinion regarding noise by natural phenomena as the least disturbing to the ears.

Table-12: Shows the different kinds of noise rated most disturbing and least disturbing by different occupation.

Occupations	Rated most disturbing	Rates least disturbing
Housewives	Noise made by people (6/10)	Seasonal noise (8/10)
Doctors	Noise made by people (6/3)	Natural Phenomena (6/8)
Teachers	Noise made by (5/3)	Natural phenomena (7/8)
Engineers	Noise made by vehicles (6/8)	Natural phenomena (6/8)
Scientists	Noise made by vehicles(5/8)	Natural phenomena (6/8)
Factory workers	Noise made by vehicles(7/8)	Natural phenomena (7/8)

MISCELLANEOUS - II PART

Analysis of adults

1. **Sleep:** s As revealed by the adults, noise made by people and the domestic appliances was considered to be very disturbing while sleeping.
2. **Noise from the public:** address system, and vehicles was found to pose lot of hindrance While attending to work/ class and resting.
3. During recreational activities such as watching TV, cinema, listening to radio, noise made by domestic appliances especially mixie, milk cooker and pressure cooker was found to be very irritating.
4. Communication at home and at office seems to be disturbed mostly by the noise made by people and the public address system.
5. Community noise, especially from the railway station, factories, main roads, and bus stops was found to affect all the activities to some extent.
6. Noise made by hawkers, seasonal noises except canvassing for elections, animals, birds, and insects and natural phenomena did not produce any significant disturbance on any of the activities.

MISCELLANEOUS

Analysis of Children

1. As reported by children, noise made by people and vehicles was considered to be very disturbing.
2. Community noise, especially from railway station, bus-stop, factories and public address system posed lots of hindrance to activities such as attending to work, class and playing activities.
3. During recreational activities, such as watching cinema, TV and listening to radio, noise made by domestic appliances, especially from mixie, milk-cooker and pressure cooker and public address system was found to be very disturbing.
4. Communication at home was mostly disturbed by the noise made by people and loud music, whereas community noise and noise made by vehicles affected the communication at school the most.
5. Noise made by hawkers, animals, birds, and insects and natural phenomena was not at all considered as disturbing.

Table-13: Shows different kinds of noises affects particular activities:

Activities	Children	Adults
1. a) Sleep	Noise by people & vehicles (30)	Noise by people and domestic appliances (35)
b) Attending to work/class	Community noise and noise from public address system(26)	Noise from public address system & vehicles(38)
c) Rest		
2. Watching TV	Noise from domestic appliances and public address system	Noise from domestic appliances (30)
3. Listening to radio		
4. Watching cinema		
5. Reading		
6. Other reevaluation facilities		
7. Daily routine		
8. Communication at home	Noise made by people and loud music (32)	Noise from public address system (35)
9. Communication at office/school	Community noise and noise made by vehicles(25)	Noise from public address system(36)
10. Elsewhere	-	Community noise (34)
11. Other activities}	-	

NOTE: The bracketed numbers shows the number of children and adults who had reported the results).

DISCUSSION

- * Both the age groups found noise made by people, community noise, domestic appliances and vehicles to be the most disturbing to different activities.
- * Noise made by hawkers, seasonal noises, animals, birds and insects and natural phenomena was not at all considered as disturbing by both the age groups.
- * Noise from the public address system was invariably found to be objectionable by both the age groups.

CONCLUSION

Its clear that noise does not lag behind any other pollutent, in polluting the harmony and physiology of the human mankind. With the never ending pace of industrial development, combined with high ignorance about the devastating effect of noise, its creeping into the life of every individual like a slow poison. Now, is the time when an old proverb has to be given a second thought*"It's better to be late than never"

So, stop it today.

Take precautions yourself and do not create conditions that makes others take precautions.

Ability to hear is a gift, from the nature. Preserve it.

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INSTRUCTIONS

Name:

Age: years. months Sex: FM

Occupation: Qualification:

Address: Present (local). Permanent

There are different kinds of sounds around us. Some are pleasant while some are disturbing. Any unwanted sound or the unpleasant sound is called noise.

A sound which is considered as noise by an individual may not be noise to the other individual, Individuals react differently to different sounds.

We have listed down a few sounds which have been considered as unpleasant and interfere with our activities. We are interested to know what sounds you consider as noise and which of your activities are affected due to noise. Please encircle those items which you consider to be disturbing and please mention why the noise is disturbing to you. Is it because the noise is loud or because it wakes you up from the sleep: For example:

1. loud music is irritating
5. interferes with my work
6. *Get* scared.

Noise made by people;

- | | |
|-----------------|-----------------------------|
| 1. conversation | 7. Going up and down stairs |
| 2. ouarelling | 8. Shuffling feet |
| 3. Screaming | 9. Applauding |
| 4. Crying | 10. Vihistling |
| 5. Laughing | 11. Singing. |
| 6. Snoring. | |

Hawkers:

- | | |
|--|---|
| 12. Milkman | 17. People who buy old paper and boxes. |
| 13. Vegetable & fruit vendors | 18. Bangles & other items |
| 14. Steel vessel vendors | 19. Fish vendors |
| 15. Plastic material repairer | 20. others. |
| 17. Tea & coffee vendors at the platform | |

Domestic appliances;

- | | |
|----------------------|-----------------------------|
| 21. Vessels | 29. Telephone |
| 22. Milk cooker | 30. Calling bell |
| 23. Pressure cookers | 31. Mixie |
| 24. Fan | 32. Musical clocks |
| 25. water tap (open) | 33. Screeching of furniture |
| 26. Gate | 34. Television |
| 27. Doors | 35. Stereo and deck |
| 28. windows | 36. Others. |

Noise by

- | | |
|------------------------------|------------------------------------|
| 37. Choultry | 49. Workshops |
| 38. Theatres | 50 Library & reading rooms |
| 39. Shopping complex | 51. Discotheques & night clubs |
| 40. Educational Institutions | 52. Hotels & restaurants |
| 41. Hospitals | 53. Music & dance classes |
| 42. Flour mills . | 54. Recording centre |
| 43. Play ground . | 55. Stadium |
| 44. .Garage | 56. Religious places |
| 45. Bus- stop | 57. -Government & Private Offices. |
| 46. Railway station | 58 . |
| 47. Airport | 59. Factories |
| 48. MainRoad & High ways. | |

- | | |
|----------------------|------------------|
| 60. Gymnasium | 64. Sports club |
| 61. Mines | 65. Race courses |
| 62. Swimming pool | 66. Walkman |
| 63. Recreation clubs | 67. Others. |

Public address system;

68. Loudspeaker during marriages and other occasions.
69. Music from radio, television and tape recorder from own, house and neighbour's house
(a) rock & roll (b) western pop (c) Indian light
(d) Indian classical (e) western classical (f) Indian pop
70. Advertising for lottery..

Seasonal:

- | | |
|------------------------------|-----------------------------------|
| 71. Public lectures | 76. Yathras, protests and strikes |
| 72. Plays/drama (street) | |
| 73. Musical programmes | 77. Religious functions |
| 74. Festivals | 78. Exhibitions/fair |
| 75. Canvassing for elections | 79. Circus. |

Noise made by animals, birds and insects:

- | | | |
|------------------|-------------------|-------------|
| 80. dog | 83. Lizard | 86. hen |
| 81. cat | 84. goat & sheep | 87. insects |
| 82. cow, buffalo | 85. crow sparrows | 88. others. |

Vehicles;

- | | | |
|----------------------------|-------------------|------------------------------|
| 89. Bikes without silencer | 94. Cycle bells | |
| 90. other 2-wheelers | 95. Auto rickshaw | |
| 91. Truck | 92. Buses | 96. Heavy-duty vehicles like |
| 93. Jeep | bulldozer, | cranes, etc. |

Natural phenomena;

97. Thunder (98.- Splashing of rains 99. Storm
100. Rustling of leaves 101. Others.

Miscellaneous: which interferes with following activity:

1. (a) Sleep, (b) Attending to work/class (c) Rest .
2. Watching TV 3. Listening to radio
4. watching Cinema 5. Reading 6. Other recreation .
- facilities 7. Daily routine 8. Communication at home.
9. Communication at office 10. Elsewhere
11. Other activities.

INSTRUCTIONS

Name:

Age: years. months

Sex: FM

Occupation:

Qualification:

Address; Present (local) .

Permanent

There are different kinds of sounds around us. Some are pleasant while some are disturbing. Any unwanted sound or the unpleasant sound is called noise.

A sound which is considered as noise by an individual may not be noise to the other individual. Individuals react differently to different sounds.

we have listed down a few sounds which have been considered as unpleasant and interfere with our activities. We are interested to know what sounds you consider as noise and which of your activities are affected due to noise. Please encircle those items which you consider to be disturbing and please mention why the noise is disturbing to you. Is it because the noise is loud or because it wakes you up from the sleep: For example:

1. loud music is irritating
5. Interferes with my work
6. Get scared.

CHILDREN

Noise made by people

- | | |
|-----------------|-----------------------------------|
| 1. Conversation | 7. Going up and down the stairsoo |
| 2. Quarelling | 8. Singing |
| 3. Shouting | 9. Whistling |
| 4. Crying | 10. clapping |
| 5. Laughing | 11. During outdoor games . |
| 6. Snoring, | 12. During indoor games. |

Hawkers:

- | | |
|-------------------------------|------------------------------|
| 13. Milkman | 19. People who buy old paper |
| AND BOXES | |
| 14. Vegetable & fruit vmdors | 20 Bangles & other items |
| 15. Beggars | 21 Fish vendor |
| 16. Tea & coffe vendors | 22 Ice cream vendors |
| 17. Steel vessel | 23. Other eatables |
| 18. Plastic material repairer | 24 Others |

Domestic appliances

- | | |
|------------------|---------------------------------------|
| 25. Vessel | 31, Window . |
| 26. Milk cookers | 32. Telephone |
| 27. Fan | 33. calling bell |
| 28. Water tap | 34. Mixie |
| 29. Gate | 35. Musical cloek |
| 30. Door | 36. Screaching of furniture in school |
| | 37. Television. |

Noise by

- | | | |
|-------------------------------|-----|-----------------------|
| 38. Cinema theatre | 50 | Music and dance clubs |
| 39. Sporting complex | 51 | Stadium |
| 40. Colleges & Schools | 52' | Religious places |
| 41. Hospitals | 53. | Offices |
| 42. Playground | 54- | Factories |
| 43. Busstop | | 55. Mines |
| 44. Railway station | 56 | Gymnasium |
| 45. Airports | | 57. Swimming pool |
| 46. MainRoad | | 58, Sports clubs |
| 47. Workshops | | 59. Walkman |
| 48. Discotheques & night club | 60. | Recreation clubs |
| Hotels & Restaurants. - | 61. | Can teen |
| | 62. | Library |

Public Address system;

- 63. Loudspeakers during marriages and other functions.
- 64. Music from radio/ TV and taperecorder from own house and neighbours.
 - a) Rock & Roll (b) western pop (c) Indian light
 - d) Indian classical (e) western classical (f) Indian pop
- 65. Advertising for lottery.

Seasonal:

- 66. Musical programmes
- 67. Public lecturer
- 68. Exhibitions
- 69. Circus
- 70. Festivals.
- 71. Election canvassing
- 72. Protests & strikes
- 73. Fairs
- 74. Others.

Noise made by animals and birds:

- 75. Dog
- 76. cat
- 77. cow/buffalo
- 78. Lizard
- 79. goat
- 80. Crow, sparrow
- 81. Hen
- 82. insects
- 83. others.

Vehicles:

- 84. Bikes
- 85. Other 2 wheelers
- 86. Car
- 87. Jeep
- 88.
- 89. Bus
- 90. Cycle bells
- 91. Autorickshaw
- 92. Heavy vehicles such as Bulldozer
- 93. Others.

Natural phenomena;

- 94. Thunder (95) Splashing of rain (96) storm (97) others.

Miscellaneous;

- II. Which interferes with the following activities.
- 1. Sleep (b) attending to class/occures (c) Rest.
 - 2. Play activities - outdoor game - indoor game
 - 3. Watching TV (4) Listening to radio (5) Watching cinema.
 - 6. Other recreation activities (7)- Homework
 - 8. Other daily routine
 - 9. Communication at home and at class and elsewhere
 - 9. Other activities.