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ANNOYANCE SCALES IN VIETNAMESE

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ABSTRACT

Standardized noise annoyance scales in Vietnamese are constructed with the method developed by ICBEN (International Commission on Biological Effects of Noise) Team 6 (Community responses to Noise) in this report. An experiment was conducted in Hanoi and HoChiMinh cities. At first, we collected 200 questionnaires from these cities considering generation and sex. Next, a standardized 5-point and 4-point verbal scales were constructed based on the rated intensity, net preference score and the deviation of the intensities for the modifiers. As a results, the 5-point verbal scale is labeled as “hoàn toàn không ồn”, “ồn vừa phải”, “không ồn quá”, “ồn nhiều” and “cực ồn”. the 4-point verbal scale is labeled as “hoàn toàn không ồn”, “ồn vừa phải”, “khá ồn” and “cực ồn”.

KEYWORDS

Annoyance, noise, survey

INTRODUCTION

Community response to noise is generally measured with questionnaires. Internationally standardized noise annoyance scales are necessary to accurately compare community responses to noise obtained from social surveys in different areas in the same or different languages. In 1997, the Community Response to Noise Team (Team 6) of the International Commission on the Biological Effects of Noise (ICBEN) agreed to construct two shared annoyance questions, one with a 4 point or a 5-point verbal scale and one with a 0 to 10 point numeric scale. A research group associated with the University of Rulr in Bochum Germany headed an effort with the ICBEN team to design an experiment to be internationally administered that would help to construct either a 4-point or 5-point scale. In November 1998, Team 6 agreed upon a procedure to choose the modifiers for the scale points. The team recommended the 5-point scale as the standardized verbal scale for the following reasons: (a) a more even distribution of the modifiers' intensity values between the minimum and the maximum; (b) smaller standard deviation; (c) more agreement in the choice of the modifiers and (d) more accurate measurement of individual evaluations.

Using the method developed by ICBEN Team 6 as described above, standardized noise annoyance scales in Vietnamese are constructed in this report. An experiment was conducted in the two big cities in VietNam, Hanoi and HoChiMinh. At first, we collected 200 questionnaires from these cities with the consideration of generation and sex. Next, we recommend a standardized 5-point and 4-point verbal scale from these questionnaires based on the rated intensity, net preference score and the deviation of the intensities for the modifiers.

MATERIALS AND METHODS

Questionnaire used in the experiment is shown in the Appendix contained the following tasks:

(a) classification of the 21 modifiers into nine categories at the maximum based on the rating of intensity of the annoyance they represent

(b) preferences for which of the 21 modifiers was to be used for each category for a 5-point and a 4-point equidistant scale, where “hoàn toàn không ồn” was fixed at the lowest point of both scales by the investigators.

(c) rating of the intensities of the 21 modifiers by marking their position on 10 cm lines, where the modifiers were presented in random order.

The 21 annoyance modifiers are shown in Table 1. They were selected from dictionaries and the related papers to widely spread on an annoyance dimension from the minimum to the maximum.

An experiment was conducted in Hanoi and HoChiMinh cities. Two hundred questionnaires were collected from these cities considering generation and sex as shown in Table 2.

Table 1 21 annoyance modifiers in Vietnamese

modifiers	Abb.	Modifiers	Abb.	Modifiers	Abb.
Cực ồn	CO	Khá ồn	KO	Ồn sơ sơ	OX
Hơi ồn	HO	Không quá ồn	KQ	Quá ồn	QO
Hơi quá ồn	HQ	Ồn một chút	MC	Rất ồn	RO
Hoàn toàn không ồn	HT	Ồn chút ít	OI	Ồn trung bình	TB
Ít ồn	IO	Ồn lắm	OL	Tương đối không ồn	TK
Không ồn lắm	KL	Ồn nhiều	ON	Tương đối ồn	TO
Không đến nỗi ồn	KN	Ồn phần nào	OP	Ồn vừa phải	VP

Table 2 Distribution of Vietnamese subjects by age and area

Area	Sex	Generations					Total
		20s	30s	40s	50s	60s over	
Hanoi	Man	10	10	9	11	10	50
	Woman	10	10	10	10	10	50
	Total	20	20	19	21	20	100
Ho Chi Minh	Man	9	10	11	11	9	50
	Women	12	11	11	11	5	50
	Total	21	21	22	22	14	100
Hanoi & HCM	Man	19	20	20	22	19	100
	Women	22	21	21	21	15	100
	Total	41	41	41	43	34	200

ANALYSIS METHOD

The criteria for choosing modifiers is shown in Table 3. The modifiers for the standard noise annoyance scale have to satisfy to

- (a) be equally spaced between the lowest and the highest annoyance,
- (b) be frequently used when people talk about noise annoyance
- (c) have a small deviation in intensity.

The selection of modifiers was based on the value of average of intensity score, the standard deviation of intensity scores and the net preference score. The net preference score is defined as the net number of selections of the modifier for a particular scale point (the numbers of selections for the scale point minus the number of selections for the other scale points) divided by the total number of subjects. The criteria from all preceding steps are included in each step with a higher number. Thus, in order to satisfy the criteria for step 6, for example, a modifier must have already satisfied the criteria for steps 1 through 5.

Table 3 The criteria for choosing modifiers

Pool formation stage	Step	Entrance criteria
BASE POOL	1	"Borderline" or higher investigator classification (i.e. IJC-2 or 3)
	2	P% > 4% (Net preference score must be at least 5%)
LOW ACCEPTANCE POOL	3	I-C Delta < 15 (Intensity score within 15 points of Intensity criterion)
	4	P% Delta > 20 (1 Preference score within 20% points of most popular remaining modifier's score)
	5	StD Delta < 15 (Standard deviation within 15 points of smallest remaining modifier's StD)
MIDDLE ACCEPTANCE POOL (10% pool)	6	I-C Delta < 10
	7	P% Delta < 15
	8	StD Delta < 10
HIGH ACCEPTANCE POOL (5% pool)	9	I-C Delta < 5
	10	P% Delta < 10
	11	StD Delta < 5
SINGLE RANKING POOL	12	Lowest I-C Delta Score
	13	Highest P% Score
	14	Lowest StD
FINAL JUDGEMENT	15	Judge > Borderline (I.e. IJC-3)

RESULTS

Average intensity scores

Average intensity is an average of the positions in which subjects marked the word on the 10cm scale when the marks are scored in millimeters (0-100). We have the modifiers from low to high annoyance as : “Hoàn toàn không ồn; Ôn một chút; Ôn chút ít; Tương đối không ồn; Ít ồn; Ôn so

sơ; Ôn vừa phải; Không đến nỗi ôn; Ôn phân nào; Không ôn lắm; Ôn trung bình; Hơi ôn; Không quá ôn; Khá ôn; Tương đối ôn; Hơi quá ôn; Ôn nhiều; Quá ôn; Rất ôn; Ôn lắm” and “Cực ôn”.

Figure 1 compares the average intensity score of 21 modifiers between the cities. Though no systematic difference was found in average intensity pattern between age brackets and between sexes, there were quite significant difference in the intensities of some modifiers between the cities.

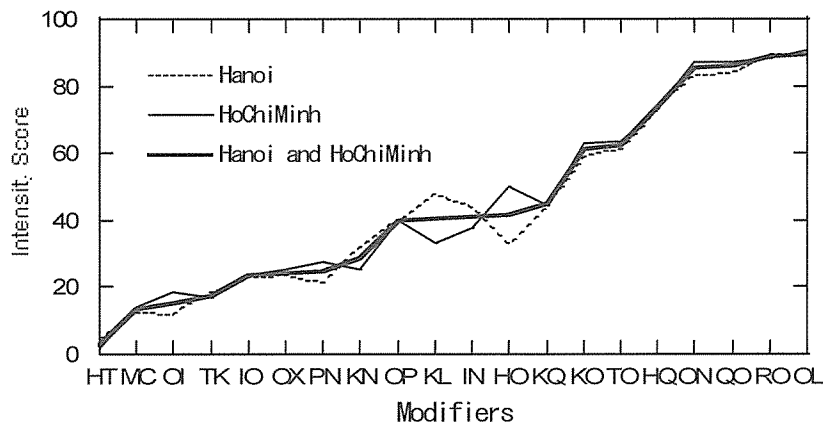


Fig. 1 Comparison of intensity score average of 21 modifiers between the two cities

Table-4 Procedure to select modifiers for the scale points

Step	Entrance criteria	category 1	category 2		category3		category 4			category 5
		HT	OX	VP	KQ	TO	KO	ON	OL	CO
0	P%	100	7	9	22	6.5	17.5	25	10	91
	I-C Delta	2.9	0.5	0.3	5.1	12.4	13.9	9.2	14.9	3.3
	Std	9.4	15.9	12.1	16	12.7	12.3	10.8	10.7	11.6
1	IJC-2 or 3	3	3	3	3	3	3	3	3	3
2	P% >=5	100	7	9	22	6.5	17.5	25	10	91
3	I-C Delta < 15	2.9	0.5	0.3	5.1	12.4	13.9	9.2	14.9	3.3
4	P% Delta < 20	0	7	5	0	15.5	7.5	0	15	0
5	Std Delta < 15	0	0	3.8	0	3.3	0	1.4	1.5	0
6	I-C Delta < 10	2.9	0.5	0.3	5.1			9.2		3.3
7	P% Delta < 15	0	7	5						0
8	Std Delta < 10	0	0	3.87						0
9	I-C Delta < 5	2.9	0.5	0.3						3.3
10	P% Delta < 10	0	5	3						0
11	Std Delta < 5	0	0	3.8						0
12	Lowest I-C Delta	2.9		0.3						3.3
13	Highest P%	100								91
14	Lowest Std	9.4								11.6
15	IJC-3									

Modifiers for 5-point scale

The selection procedure puts much greater importance on the intensity scores than the net preference score. The researchers considered the pool of modifiers for each of the scale points

independently by proceeding through the selection stages listed in Table 4 until all modifiers but one had been eliminated. That remaining modifier was chosen as the modifier for the particular scale point. When all the remaining modifiers in a pool fail the same criterion, the modifier that performs best on that criterion is selected. The process to select modifiers for 5-point scale is presented in Table 4.

As a result, the 5-point scale are labeled as “hoàn toàn không ồn”, “ồn vừa phải”, “không ồn quá”, “ồn nhiều” and “cực ồn”.

Modifiers for 4-point scale

The same process as described above is performed to select the modifiers for 4-point scale. As a result, the 4-point scale are labeled as “hoàn toàn không ồn”, “ồn vừa phải”, “khá ồn” and “cực ồn”. Relationship between the 5-point scale and 4-point scale can be summarized in Table 5.

Table 5 Modifiers for the 5-point and 4-point scales in Vietnamese

5 point scale		4 point scale	
Category	Modifier	Category	Modifier
5	cực ồn	4	cực ồn
4	ồn nhiều	3	khá ồn
3	không ồn quá	2	ồn vừa phải
2	ồn vừa phải	1	hoàn toàn không ồn
1	hoàn toàn không ồn		

THE RECOMMENDED NOISE REACTION

In order to measure and compare annoyance between different social surveys, ICBEN team 6 recommends that each survey have to use two questions consists of one verbal answer scale question (Q.V.) and one numeric answer scale question (Q.N.). In English, the questions are the following :

QV “Thinking about the last (...12 months or so..), when you are here at home, how much does noise from (...noise source...) bother, disturb, or annoy you; Extremely, Very, Moderately, Slightly or Not at all?”

QN “Next is a zero to ten opinion scale for how much (...source..) noise bothers, disturbs or annoys you when you are here at home. If you are not at all annoyed choose zero, if you are extremely annoyed choose ten, if you are somewhere in between choose a number between zero and ten. Thinking about the last (...12 months or so..), what number from zero to ten best shows how much you are bothered, disturbed, or annoyed by (...source..) noise?”

The problem is how to translate exactly the words “bother, disturb, or annoy” and “Extremely, Very, Moderately, Slightly or Not at all” to Vietnamese language. The latter was constructed in the chapter of “RESULTS”. Twenty three subjects of language teachers, acoustic engineers, environment engineers between the ages of 30 and 65 who were fluent in Vietnamese and English participated in the translation/back-translation study between Vietnamese and English question wordings. The following Vietnamese translated results are obtained:

QV Trong thời gian qua (một năm gần đây), bạn đã bị khó chịu, quấy rầy bởi những tiếng ồn (...từ các nguồn gây tiếng ồn...) với mức độ thế nào? Cực ồn, ồn nhiều, không ồn quá, ồn vừa phải hoặc hoàn toàn không ồn?

QN Sau đây là thang chuẩn từ 0 cho tới 10 biểu thị mức độ của tiếng ồn đã gây khó chịu, quấy rầy bạn khi bạn sống ở trong nhà. Nếu bạn thấy hoàn toàn không ồn bạn chọn số 0, nếu thấy cực ồn bạn chọn số 10, ngoài ra bạn chọn con số giữa 0 và 10 cho thích hợp. Bạn sẽ chọn số mấy để đánh giá mức độ của tiếng ồn đã gây khó chịu, quấy rầy bạn trong thời gian qua (một năm gần đây) ?

CONCLUSIONS

From the 200 questionnaires obtained in Hanoi and Ho-Chi-Minh cities, a standard 5-point and 4-point verbal scale are constructed based on the rated intensity, net preference score and the deviation of the evaluations for the modifiers. As a results, the 5-point verbal scale are labeled as “hoàn toàn không ồn”, “ồn vừa phải”, “không ồn quá”, “ồn nhiều” and “cực ồn”. the 4-point verbal scale are labeled as ”hoàn toàn không ồn”, “ồn vừa phải”, “khá ồn” and “cực ồn”.

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