

가

Assessment of Annoyance Cause by Different Types of Construction Noises

† . *

Sung Chan Lee and Jin Yong Jeon

(Received November 13, 2013 ; Revised November 27, 2013 ; Accepted November 27, 2013)

Key Words : Construction Noise(), Annoyance Assessment(가)

ABSTRACT

In the present study, annoyance caused by diverse construction noises was evaluated through surveys. A survey with a total of 110 construction workers was carried out to investigate annoyance from construction noises at different construction phases. The most effective item of adverse by construction noise was annoyance and the most annoyed construction stage was destruction construction. There were high correlation between work performance and work safety as well as work safety and speech interference. Participant's noise sensitivity were significant between low and high group at work performance, work safety, speech interference.

1.

(1)

가 (2)

가 5 dB (321) 가

가

가

(3,4)

가

(5-7)

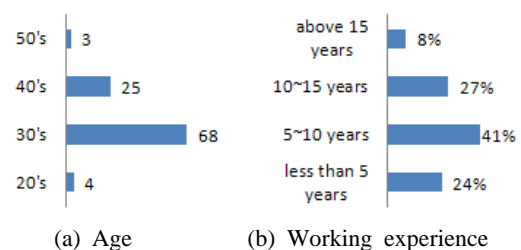
가 (8-10)

† Corresponding Author ; Member, Hanyang University
E-mail : sungchan@hanyang.ac.kr
Tel : +82-2-2220-1795, Fax : +82-2-2220-4794
* Member, Hanyang University

A part of this paper was presented and selected as one of best papers at the KSNVE 2011 Annual Autumn Conference
‡ Recommended by Editor Myung Jun Kim
© The Korean Society for Noise and Vibration Engineering

2.1 가

2.2 가



(a) Age (b) Working experience

Fig. 1 Ratio of participant's information

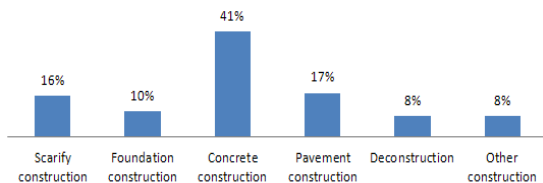


Fig. 2 The most annoying construction stage

Fig. 1 가 5 24 %, 5~10 41 %, 10~15 26 %, 15 8 % 20 가 4 %, 30 58 %, 40 22 %, 50 3 % .

Fig. 2 가 41 %

3.1 가

Fig. 3 51%가 가 (18%), (17%), (13%), (1%)

Fig. 4 가 25가 가 가 (6%), (4%), (7%), (4%)

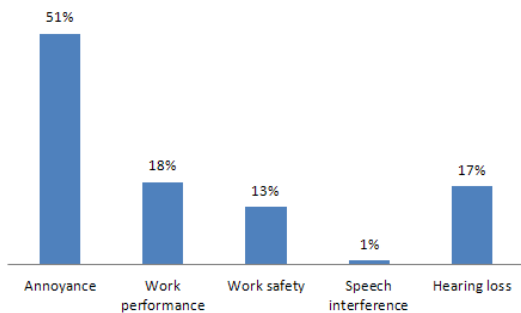


Fig. 3 Adverse effect of construction site noise

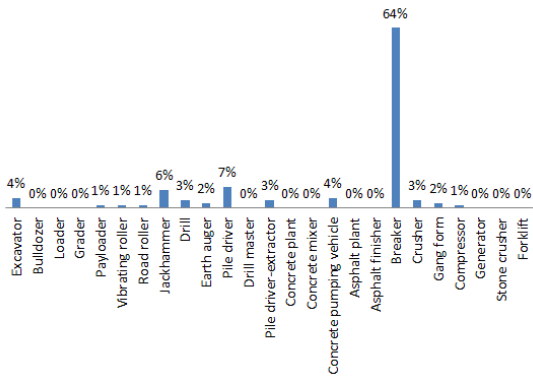
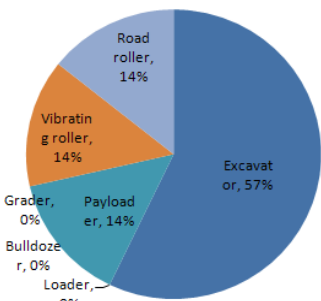
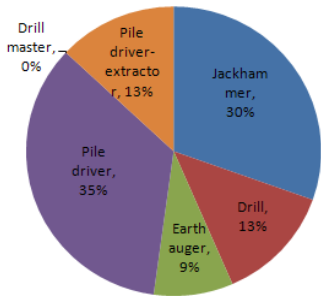


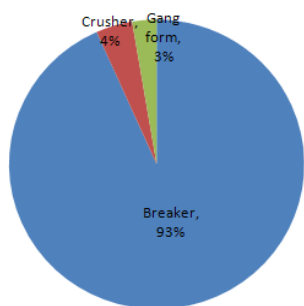
Fig. 4 Most annoyed construction machinery



(a) Deconstruction



(b) Foundation



(c) Scarify

Fig. 5 Annoyed machinery of each construction

가
 ,
 Fig. 5 가
 93%
 가
 35% 30%
 가 57% 가
 가 14%

3.2 가

가 ,
 가 가
 Fig. 6 가
 가
 68% (19%),
 (6%), (5%)
 가 ,
 ,
 0~10 11
 가
 Fig. 7 가
 가 4.9 가
 (4.7), (4.7)
 가
 5.4가 가 (4.5),
 가

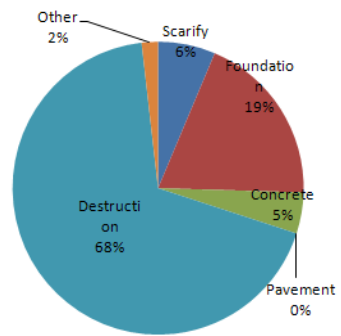


Fig. 6 Annoyed ratio of construction stage

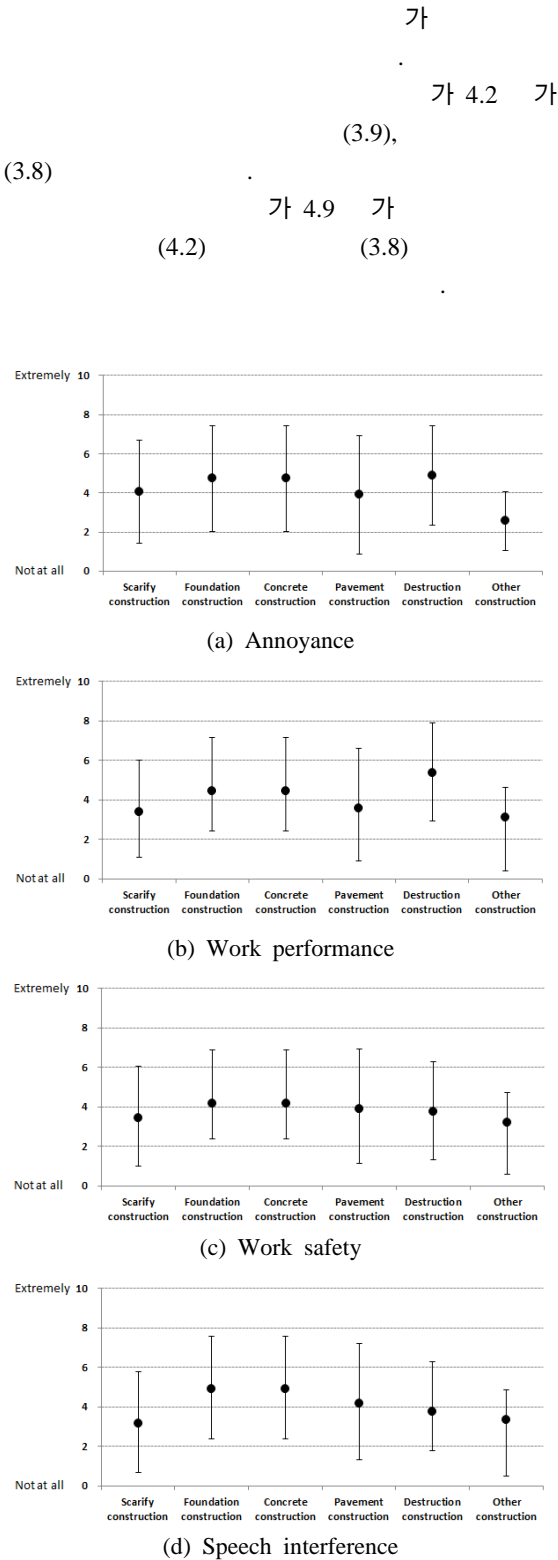


Fig. 7 Adverse effect score of construction stage

4.
Table 1
가 , , ,
가 0.82, 가 0.87
가
가
가
가
4가
(가 , ,)
가 (0~10)
가 , , ,
가

Table 2

가 , , ,
가 0.05

Table 1 Correlation among adverse items

	Annoyance	Work performance	Work safety	Speech interference
Annoyance	1	0.74**	0.70**	0.67**
Work performance		1	0.82**	0.77**
Work safety			1	0.87**
Speech interference				1

**p<0.01

Table 2 ANOVA analysis result

		Sum of square	df	Mean square	F-value	p-value
Annoyance	Between group	115.151	10	11.515	2.052	.036
Work performance	Between group	149.050	10	14.905	3.201	.001
Work safety	Between group	166.027	10	16.603	3.429	.001
Speech interference	Between group	176.158	10	17.616	2.833	.004

가 , , 가
가
가
가

References

(1) Official Journal of the European Communities, Directive 2000/14/EC of the European Parliament and of the Council of 8 May 2000 on the Approximation of the Laws of the Member States Relating to the Noise Emission in the Environment by Equipment for the Use Outdoors.

(2) Chung, J. Y. et al., 2010, Acoustic Properties of Temporary Noise Barriers on Construction Site, The Korean Society for Noise and Vibration Engineering, Vol. 20, No. 2, pp. 191~198.

(3) Manatakis, E. K., 2000, A New Methodological Trial on Statistical Analysis of Construction Equipment Noise, Applied Acoustics, Vol. 59, No. 1, pp. 67~76.

(4) Yoshinaga, H. et al, 2006, Analysis of Individual Machine Noise in Construction (2), Internoise2006.

(5) Ballesteros, M. J. et al, 2010, Noise Emission Evolution on Construction Sites. Measurement for Controlling and Assessing Its Impact on the People and on the Environment, Building and Environment, Vol. 45,

No. 3, pp. 711~717.

(6) Wu, W., 2008, Noise Assessments for Construction Noise, Internoise2008.

(7) Towers, D. A., 2001, Mitigation of Community Noise Impacts from Nighttime Construction, Construction and Materials Issues 2001 pp. 106~120.

(8) Cheuk, F. N., 2000, Effects of Building Construction Noise on Residents: A Quasi-experiment, Journal of Environmental Psychology, Vol. 20, No. 4, pp. 375~385.

(9) Reeb-Whitaker, C. K. et al, 2004, Accuracy of Task Recall for Epidemiological Exposure Assessment to Construction Noise, Occupational and Environmental Medicine, Vol. 61, No. 2, pp. 135~142.

(10) Fernandez, M. D. et al, 2009, Noise Exposure of Workers of the Construction Sector, Applied Acoustics Vol. 70, No. 5, pp. 753~760.



Sung Chan Lee, who is a Ph.D. candidate in the Department of Architectural Engineering at the Hanyang University has research experience in the area of environmental noise and its assessment, monitoring of construction noise, and architectural acoustics.