



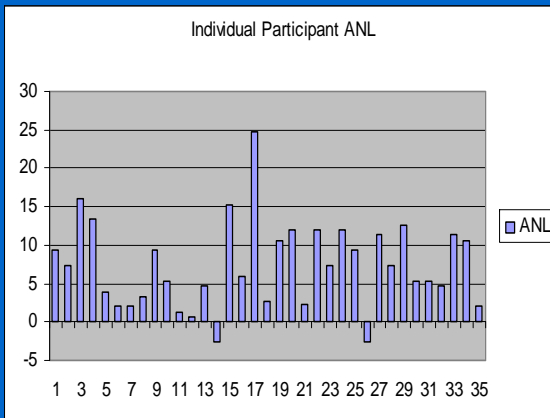
# Relationship of Acceptable Noise Level to Noise Sensitivity

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## INTRODUCTION

The Acceptable Noise Level (ANL) has been defined as the highest level of background noise a listener is willing to accept while listening to speech. Nabelek, Freyaldenhoven, Tampas, Burchfield, and Muenchen (2006) reported that ANL can be used to accurately predict hearing aid success. Individuals with low ANLs accept more background noise and tend to be successful with hearing aids, while those with high ANLs accept less background noise and tend to be unsuccessful with hearing aid use. Multiple factors are probably involved in forming an individual's ANL. One possible factor is noise sensitivity. Noise sensitivity was defined by Job (1999) as the internal state of an individual that increases their reaction to noise. The purpose of this study was to investigate the relationship of ANL to noise sensitivity.

FIGURE 1



## PARTICIPANTS, MATERIALS, AND PROCEDURES

### PARTICIPANTS

Thirty-four adults participated in this study. Each participant met the following criteria:

- Age 19 to 30 years
- Normal hearing
- Dorm resident
- No significant otologic, medical, or speech/language history

### MATERIALS

ANL: Primary speech discourse - male talker reading the Arizona Travelogue  
Secondary/background noise - twelve-talker babble from the R-SPIN test  
Weinstein Noise Sensitivity Scale  
21 statements about noise sensitivity involving common situations in dormitory life; Likert scale.

### PROCEDURES

#### Preliminary tasks

- Read and signed IRB approved consent form
- Questionnaire regarding speech/language history, otologic history, and medical history
- Hearing screening (.5k, 1k, 2k, & 4k Hz at 25 dB HL)

#### Experimental tasks

- Weinstein Noise Sensitivity Scale
- ANL measurement

#### ANL measurements

- Most comfortable loudness (MCL)  
Participants' preferred listening level for the primary signal
- Background noise level (BNL)  
The maximum background noise level that was acceptable while listening to the primary discourse at MCL

$$ANL = MCL - BNL$$

## RESULTS

Mean ANL (SD) = 8.21 (5.21). Individual participant data can be found in Figure 1. A Pearson product-moment correlation for ANL and Weinstein total score was not significant. However, Pearson product-moment correlations were significant for statements 3, 5, 14, & 16.

In order to determine if these questions might be useful for predicting ANL, a linear regression was completed. The relationship between ANL and questions 14 & 16 was significant  $R^2 = .43$ , adjusted  $R^2 = .40$ ,  $F(1,32) = 11.50$ ,  $p < .01$ .

#### Questions useful for predicting ANL

14. I am good at concentrating no matter what is going on around me.

- Strongly agree = Low ANL
- Strongly disagree = High ANL

16. There are times when I want complete silence.

- Strongly agree = High ANL
- Strongly disagree = Low ANL

## DISCUSSION

These findings indicate that some aspects of noise sensitivity are involved in an individual's acceptance of background noise. Future research is needed to generate and evaluate test items that might assist in predicting an individual's acceptance of background noise. This will provide researchers with a better understanding of those individuals who are successful and unsuccessful hearing aid users.