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**THE IMPORTANCE OF THE ABSOLUTE JUDGEMENTS OF LOUDNESS  
AND THEIR DETERMINING FACTORS**

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**INTRODUCTION**

Some new investigations of judgements on loudness exhibit a lot of factors which are determining the judgements on loudness /1 /2 /3 /. In this lecture we discuss some subjective variables which are involved in the momentary absolute judgement of loudness of an individual under laboratory conditions. It is a hypothesis that in the laboratory situation, too, judgements on loudness are given in the context of the individual and social background of the subjects.

**THE INVESTIGATION**

Judging the loudness in everyday life a person will usually use *absolute* judgements such as *soft, loud, very soft, very loud* and so on.

In our investigation we present some traffic noises in an anechoic room. The subjects have to evaluate the instantaneous loudness of traffic noise with the aid of an *analog category scale* /4 /5 /6 /, which has been especially developed for these tests. The judgement on loudness is given by a button, which can be shifted continuously over a range of 10 cm, which is equally divided into five categories: *very soft, soft, medium, loud, very loud*. The test persons are allowed to use any position on the scale. The whole test takes about thirty minutes. The presentation is optimized in such a way that the subject has a natural impression of the traffic noises presented. The method itself and its implication are detailed in another lecture /7/.

Fourteen subjects at the age of twenty-two to forty-nine years took part in the test, five of them were trained test persons. They had already had some experience with psycho-acoustical tests in the anechoic room. For both the trained and untrained subjects it is of importance that it is the first time they take part in such a kind of loudness experiment with an analog scale. Before the experiment was started the untrained subjects had the opportunity to become familiar with the anechoic room by walking around and gathering some acoustical impressions of this unusual environment. After this introduction the subjects were instructed on how to perform their task during the experiment /7/.

After the experiment we had interviews with the subjects about their impressions and experiences and these dialogues took about half an hour. From these interviews we experienced how the subjects felt during the experiment, what kind of impressions they had in the laboratory situation, and how they were able to express their loudness impression with the aid of the analog scale and which criteria were important for their decisions.

The statements given by the subjects could be grouped into the following topics: estimations of the laboratory situation, reports from the handling of the scale and the criteria for their loudness evaluation. From the subject's answers we could conclude that it is of importance to distinguish between the statements of trained and untrained subjects.

#### Laboratory situation

Trained and untrained subjects coped differently with the laboratory situation. The trained subjects were not affected by the situation in the laboratory. Some were willing to take part in the experiments for even more than thirty minutes. However, the untrained subjects reported, that the situation was very strenuous for them. Some other subjects felt irritated on the anechoic room. A typical remark was: "the wedges below, you feel a bit suspended". They often criticized some voices to be heard from the people recording traffic noises. Because of this they felt distracted from their actual task.

#### The use of the categorical scale

Those responses of the subjects concerning the motorial transformation of the loudness sensation into the movement of the response knob are subsumed under the description *the use of the categorical scale*. Here we could not state any difference between trained and untrained subjects. The responses cover a range from "it is difficult to follow with the response button" to "the judgement is a bit delayed", "I couldn't follow immediately" to "after short accustomation I could cope well with the categorical scale" and "it would be better to give the judgement upon the end of the noise situation". Some subjects proposed to include more softer noises in the presentation. Some remarked that the categorical scale offered more possibilities of answering than they needed in the particular situation. A typical remark was "I didn't feel anything was soft" or "during the pauses I didn't realize in the beginning that it was absolutely soft."

#### Decision Criteria

Under the term *decision criteria* we subsume all the statements that the subjects considered as important for describing the judgement procedure. In our analysis we can differentiate the statements regarding the loudness and the meaning of the noises.

The loudness of the noises. All subjects regard the noises as being natural and in their opinion they are appropriately loud. From this we conclude that the presentation of the noises corresponds with the expectation of the loudness which is known from experience.

Some subjects remark that no noise could be categorized as very soft. Only two subjects criticize that no noise was really loud. Nevertheless, they have the impression that the noises are realistic. These two persons, who are exceptions in the group of subjects were pop musicians. An analysis of our measurement shows, that in correspondence with the results of the analysis of the interviews, the group of subjects can be divided into subjects who show a more sensitive reaction to the traffic noises offered and subjects who react less sensitively. Those results are described in another lecture /7/.

The meaning of the noises. The meaning of the noises is important for the judgement of their loudness. Several subjects for instance describe that they categorize noise from cars as loud, which they feel to be rather nervy than loud. The subjects assume that their experiences with such vehicles have a definite influence on their loudness judgement. Other subjects emphasize that they often judge the objects instead of their loudness. In this context the associations seem to play a particular role. Depending on the special noise a road, a construction site and so on are associated. "When I hear the dredger I remember some concrete situation". The meaning which is connected with a particular noise leads to a specific judgement for some subjects. They push the response knob, as if they want to follow the approaching car and they shift the response knob to higher categories and release the button when the car is passing by. Their reaction does not correspond with their actual loudness sensation.

#### CONCLUSIONS

The analysis of the interviews of the subjects shows that a number of variables has influenced their loudness judgements. This is illustrated in the figure. These are mainly variables concerning the actual state and the motivation of the subject as well as those corresponding to the artificial surrounding laboratory situation, to the instruction and its interpretation by the subjects. The variables consist of the noise itself with its implications, of the identification of the noises, the experience with the noise, its meaning and its implicit associations as well as the context in which the noise appears.

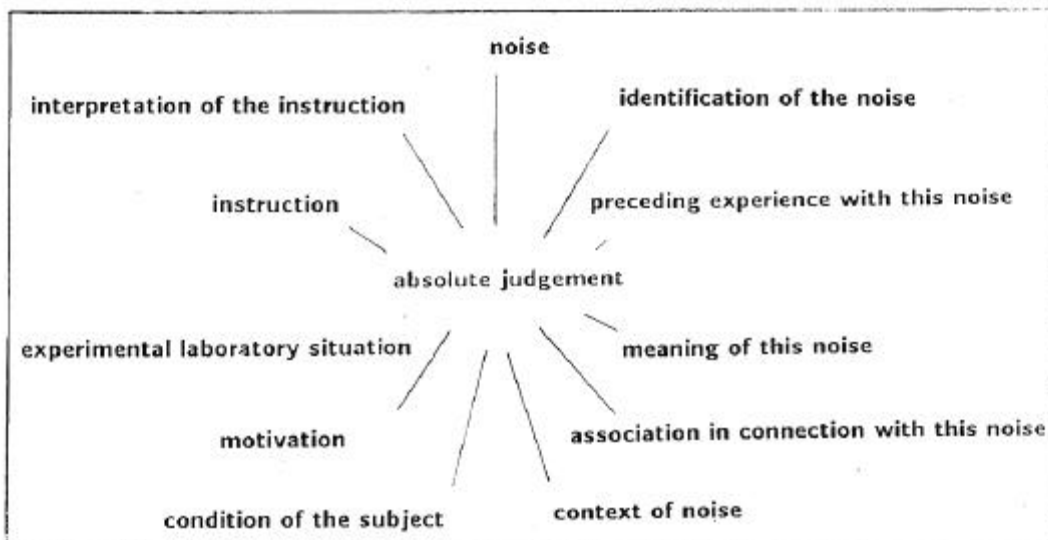


Figure: Subjective variables influencing the absolute judgement on loudness

Our results show that the given *absolute* loudness judgements are *relative* judgements, which are influenced by the laboratory situation as an artificial environment on the one hand as well as by the implications which are connected with the natural noises.

In more intensive interviews with selected subjects we found out that there is some relation between the actual judgement of a natural noise presented in the laboratory and the noise experiences subjects have made in the course of their life. One subject, who reacted especially sensitive to the noise of construction vehicles, reported that she grew up in an area with newly built houses and that she was reminded of playing situations in her childhood which were often associated with the noise of disturbing construction vehicles. Another subject who had already often driven lorries reported that during the evaluation of the lorry noise she judged rather the nerviness of the noise connected with the impression of wrong chagement of gears in the vehicle.

We can state that the presentation of natural noises in an unechoic room evokes special effects in the subjects. The judgement of the loudness of traffic noises is affected by the experiences of the subjects concerning these noises. We assume that individual experiences of the subjects with specific noises are of special meaning in their process of socialisation and for their acting. We can further assume that social print by the noise history of the subject is also effective in laboratory situation for their judgement behaviour. These hypotheses will play a central role in our further investigations.

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