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FIRST STEPS TOWARD THE CONCEPT OF QUIETNESS AND ITS
PSYCHOLOGICAL AND ACOUSTICAL DETERMINANTS.

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INTRODUCTION

Individual correlations between averaging or time-integrating acoustical parameters (like L_{eq} or L_m) on one hand, and residential satisfactions with the acoustical climate on the other, are not perfect, but seem to come relatively close, if you handle only one sound source at a time; they drop substantially, if you compare different sound sources /1/. Besides other reasons, this drop may be due to different time structures of the diverse sound sources, especially due to the number of loud events, and the duration of quiet periods between loud events /2/. It has been shown, that the general evaluation of the acoustical climate in residential areas does correlate quite good with special acoustical parameters, which count and weight the number of 1-, 2-, or 3-minute periods, in which the sound level drops below a certain limit /1/. These calculations have been done without special knowledge about quietness: we just hope, that these small periods reflect "quiet periods" which are perceived and positively evaluated by the residents.

Maybe, that we know a bit about noise - but, what do we know about "quietness"? One purpose of our present line of research is to improve covariations between time-integrating acoustical concepts and psychological concepts; a special purpose of the present study is to explore the meaning of "quietness", and to test different instruments for the measurement of its meaning.

PROCEDURES

In the first study, 30 german students at the Institute for Psychology, Technical University of Berlin, used four techniques in order to describe their specific concept of "quietness" and 20 other related terms. These terms are listed in table 1 in English and German - they were presented in German only.

Table 1: 21 stimulus words in the context of "quiet".

1. Abend (evening)	12. Nacht (night)
2. Alltag (workday)	13. Ruhe (quietness)
3. Arbeiten (work)	14. Schlaf (sleep)
4. Erholung (recreation)	15. See (lake)
5. Frieden (peace)	16. Sonntag (sunday)
6. Hektik (hectic)	17. Stadt (city)
7. Kampf (fight)	18. Stille (silence)
8. Krach (roar)	19. Tag (day)
9. Lärm (noise)	20. Wald (forest)
10. Leben (life)	21. Wohnen (dwelling)
11. Morgen (morning)	

All subjects used four techniques:

1. free associations with all 21 terms,
2. semantic differentials with all 21 terms and 22 adjective-pairs each,
3. a complete similarity rating of all possible pairs of the 21 terms, and
4. a free sorting of the 21 terms with respect to similarity.

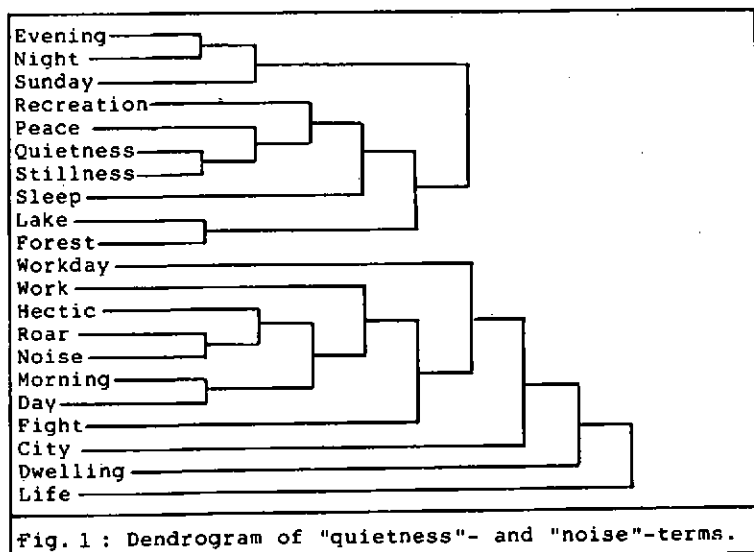
RESULTS

1. With regard to associations, the term "quietness" mainly elicited responses like "recreation", "relaxation" "thoughts", "mental concentration" etc., that is, this term seems to be associated with human activities, which serve recreational functions. The term is only partially associated with the physical aspects of sound or silence. In contrast to this, the term "noise" is mainly associated with sources of noise (e.g. cars and street traffic). The meaning of "quietness" seems to be broader and less acoustically determined than the term "noise".
2. With regard to the semantic differential, the term "quietness" has connotative meanings like "quiet",

"peaceful", "soft", "comfortable", and "still". In relation to the three well-known semantic factors, this term seems to be positively evaluated, with low loadings on "activity" and "power". The semantic profile has greatest similarities with the terms "silence", "night", "sleep", "sunday", and "evening"; and the mean profile distances are lowest with the terms "silence", "sleep", "night", and "lake". In some contrast to the results of the associations, the semantic differential of the term "noise" seems to reflect mainly the direct opposite connotative meanings of the term "quietness": it is rated "loud", "unpleasant", "nervous", "aggressive", and "bad". It has greatest profile similarities with the terms "roar" and "hectic"; its greatest dissimilarities with "sunday" and "stillness". The mean profile distances are lowest with the terms "roar", "hectic", "city", and "fight".

3. A comparison of the means of the direct similarity ratings of all possible pairs of the 21 terms shows the highest similarity ratings of "quietness" with "stillness", "recreation", "forest", "peace", "sleep", and "night"; it is rated very dissimilar to "hectic", "fight", "noise", and "city". The term "noise" is rated very similar to the terms "roar", "hectic", and "city"; it is rated very dissimilar to "forest", "sleep", "recreation", and "lake". In a multidimensional scaling analysis, three factors were accepted to represent the common space of meanings: the first is mainly defined in terms like "night" and "sleep", the second by "sunday" and (negatively) "fight", the third by "roar", "noise", "city", "hectic", and (negatively) "lake" and "forest". In this analysis, the terms "quietness" and "noise" are located on the same dimension.

4. By means of the sorting technique, the term "quietness" was placed very often in one group together with "stillness", "peace", "recreation", and "sleep"; it was never placed in one group together with "workday", "fight", and "city" or "day". The term "noise" often was placed in one group together with "roar", "hectic", "fight", and "city", never in one group together with "evening", "recreation", "night", "sleep", "lake", or forest". The cluster analysis of these groupings clearly shows "quietness" and "noise" to be associated with very different terms: "quietness" and "stillness" seem to be equivalent, and as a group associated with "peace", "recreation", and "sleep"; whereas "noise" and "roar" seem to be equivalent, and as a group associated with "hectic", and the "morning/day"-group, then with "work" and "fight". There are no connections between the "noise"- and "quietness"-groups (see Fig. 1).



CONCLUSIONS

With regard to the methods, both free associations and term-sorting seem to be easy to administer in a field study with non-student subjects, and at the same time providing for reliable and interpretable results. Regarding content, we have to acknowledge, that "quietness" is a term with very little acoustical determinants, except for the necessary absence of noise. "Quietness" refers to recreational activities, which need time, and it is doubtful, whether this aspect can be reflected by acoustical parameters, which only encompass seconds or some minutes.

REFERENCES

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