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Acoustics — Soundscape —

Part 1: Definition and conceptual framework

Acoustique — Paysage sonore —

Partie 1: Définition et cadre conceptuel

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Foreword

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The committee responsible for this document is ISO/TC 43, *Acoustics*, Subcommittee SC 1, *Noise*.

ISO 12913 consists of the following parts, under the general title *Acoustics — Soundscape*:

— *Part 1: Definition and conceptual framework*

The following part is under preparation:

— *Part 2: Methods and measurements*

Introduction

Soundscape studies have a rich tradition[1],[2],[3],[4],[5]. Because the field has evolved differently around the world, as well as across disciplines, there is a diversity of opinions about its definition and aims. Consequently, the use of the term 'soundscape' has become idiosyncratic and ambiguous[6].

This International Standard aims to enable a broad international consensus on the definition of 'soundscape', to provide a foundation for communication across disciplines and professions with an interest in soundscape.

There are similarities between the concepts of 'landscape'[7] and 'soundscape'; both are based on perception by people. For the purpose of this International Standard, soundscape will be understood as a perceptual construct, related to a physical phenomenon. The standard distinguishes the perceptual construct (soundscape) from the physical phenomenon (acoustic environment), and clarifies that soundscape exists through human perception of the acoustic environment.

Acoustics — Soundscape —

Part 1:
Definition and conceptual framework

1 Scope

This International Standard provides a definition and a conceptual framework of soundscape. It explains factors relevant for measurement and reporting in soundscape studies, as well as for planning, design and management of soundscape.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply

2.1
sound sources
sounds generated by nature or human activity

Note 1 to entry: See Reference [6].

2.2
acoustic environment
sound at the receiver from all sound sources as modified by the environment

Note 1 to entry: Acoustic environment can be actual or simulated, outdoor or indoor, as experienced or in memory.

2.3
soundscape
acoustic environment as perceived or experienced and/or understood by a person or people, in context

3 Conceptual framework of soundscape

3.1 General

Figure 1 describes the process of perceiving or experiencing and/or understanding an acoustic environment, highlighting seven general concepts and their relationships: (1) context, (2) sound sources, (3) acoustic environment, (4) auditory sensation, (5) interpretation of auditory sensation, (6) responses, and (7) outcomes[6],[8],[9],[10].

NOTE Figure 1 illustrates that soundscape is people's perceptions or experiences and/or understanding of an acoustic environment. However, practical applications will tend to emphasize management or change in sound sources and the acoustic environment. The principle is that measurement, assessment or evaluation of soundscape, in accordance with this International Standard, is through human perception of the acoustic environment.

3.2 Context

The context includes the interrelationships between person and activity and place, in space and time[6],[10],[11]. The context may influence soundscape through (1) the auditory sensation, (2) the interpretation of auditory sensation, and (3) the responses to the acoustic environment:

a) Examples of factors that may influence auditory sensation, besides the acoustic environment, include meteorological conditions (which vary by the season), hearing impairments and hearing aids;

b) Examples of factors that may influence the interpretation of auditory sensation include attitude to the sound source and to the producer of the sound, experience and expectations (including cultural background, intentions or reason for being at a place), as well as other sensory factors, like visual impression and odour;

c) Examples of factors that may influence the responses to an acoustic environment include time of day, lighting and weather; emotional state, psychological and physiological resources to deal with the situation, perceived ability to control one's exposure to sounds, as well as personal activities and those of others.

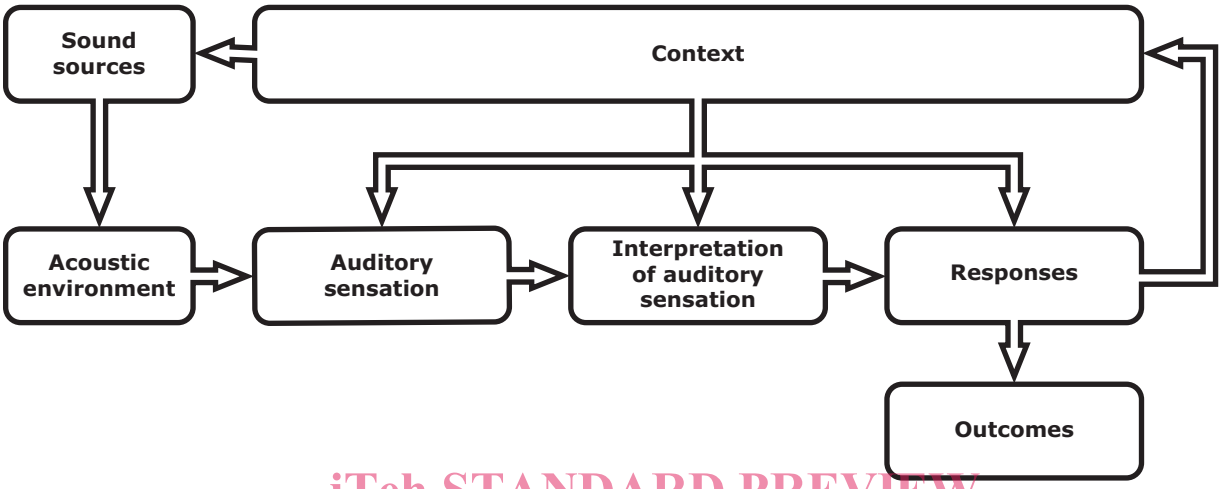

Figure 1 — Elements in the perceptual construct of soundscape

3.3 Sound sources

Soundscape originates in sound sources (e.g. road traffic, chirping birds, voices, footsteps, etc.) and their distribution in space and time.

3.4 Acoustic environment

As given in Definition 2.2 the acoustic environment is the sound from all sound sources as modified by the environment. Modification by the environment includes effects on sound propagation, resulting for example from meteorological conditions, absorption, diffraction, reverberation and reflection[11],[12],[13].

3.5 Auditory sensation

Auditory sensation is a function of neurological processes that begin when auditory stimuli reach the receptors of the ear. This is the first stage in detecting and representing the acoustic environment. Auditory sensation is influenced by masking, spectral contents, temporal patterns and spatial distribution of the sound sources (cf. psychoacoustics[14],[15]).

3.6 Interpretation of auditory sensation

Interpretation of auditory sensation (auditory perception) refers to unconscious and conscious processing of the auditory signal to create useful information, which may lead to awareness or understanding of the acoustic environment. Awareness of the acoustic environment, in context, represents an experience of the acoustic environment.

NOTE An example of unconscious auditory perception is how sounds are processed during sleep.

3.7 Responses

Responses include short-term reaction and emotion, as well as behaviour, which may change the context.

EXAMPLE Person A sitting by a fountain in an urban park may respond with emotions of joy and relief because the fountain masks the surrounding road-traffic noise. As a result, Person A may choose to stay longer. Person B passing by the fountain on a walk through the park may respond with emotions of annoyance, and choose to leave immediately.

3.8 Outcomes

Outcomes are an overall, long-term consequence facilitated or enabled by the acoustic environment. Outcomes include attitudes, beliefs, judgments, habits, visitor/user experiences (e.g. activities, actions and mental states), health, well-being and quality of life, as well as reduced social costs for society.

EXAMPLE Person A (in the example of 3.7) may decide to return to the park the next weekend or "frequently". Person B (in the example of 3.7) may decide to never return.