Introduction to Principles of Spatial Audio Technology

Spatial Audio: Auditory Experiemnts

dominik.schlienger@uniarts.fi

Universities of the Arts Helsinki, Sibelius Academy, Centre for Music & Technology

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Outline

Experiment No 1

Experiment No 1 was nearly a proper "threshold of perceptibility" psychophysical experiment.

We (sort of) established the difference threshold of localisation blur for various signals, and found out how various signals' perceptual thresholds vary.

This particular threshold is called "localisation blur". It indicates the smallest detectable difference in position.

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... and the fact that we sometimes can't differentiate if a sound comes from exactly ahead or from exactly behind us.

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Experiment No 3

Experiment 3 shows that we do indeed hear elevation, but not at all angles equally well.

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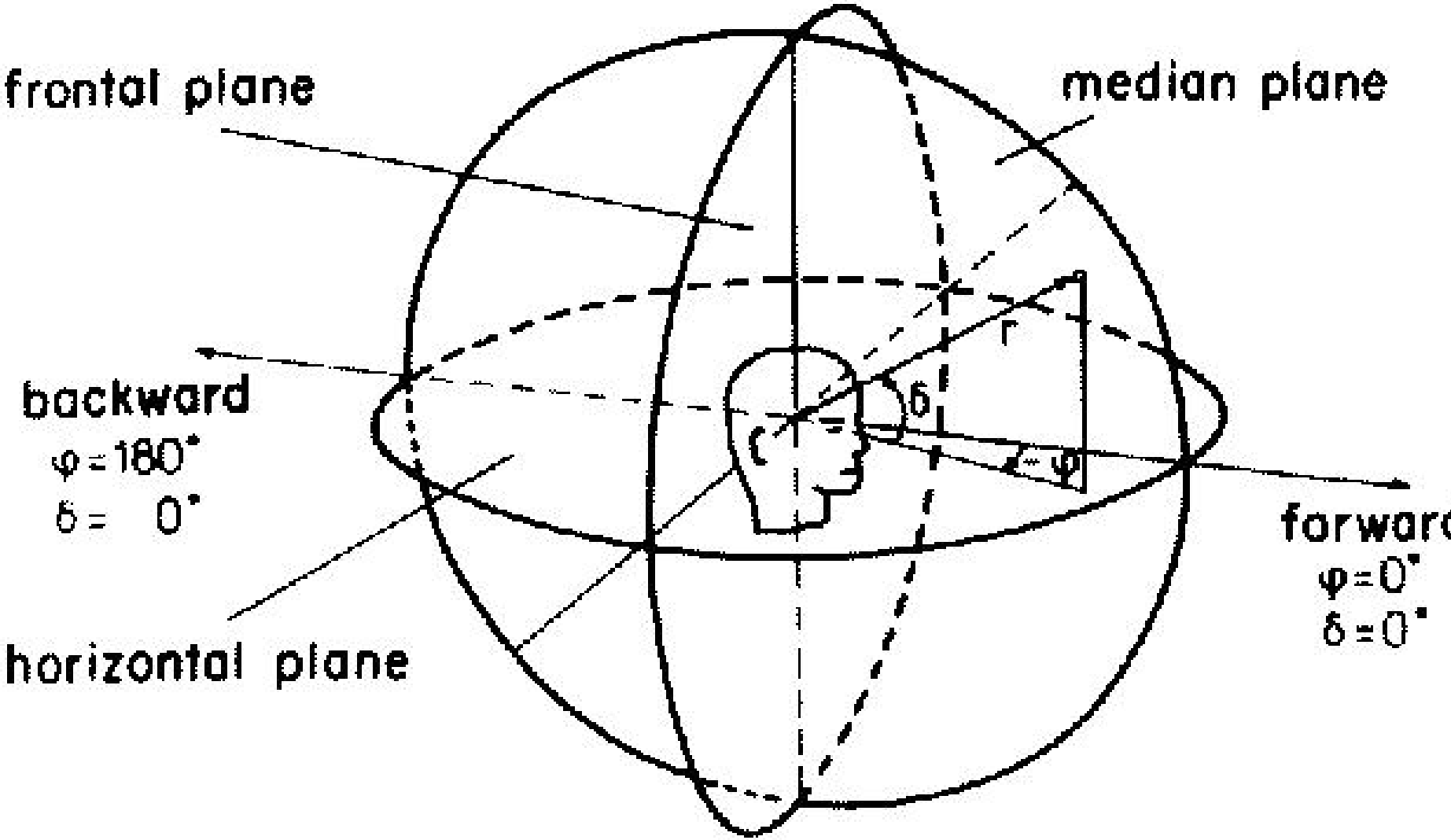
Head Related system of Coordinates 2 (Blauert 1996)



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Psychometric Methods

Measurement scales:

Nominal (L/R)

Ordinal (1m distance, 2 m distance)

Interval (larger than /smaller than

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Two Main Methods

1. **Methods of adjustment**
   Input is *varied* until judgement is met.
   (e.g.: Equal loudness test)

2. **constant, or interrogative methods:**
   Variable of interest stays *constant* within a test instance.

   - From a set of consistently organised judgements participants choose the most appropriate.

   - In the repeat of the experiment, the variations of the input of interest follow a stochastic pattern. This is then followed by statistical evaluation.
   (L/R, speaker 1-8)

Further: Pointer method: an auditory event is pointed out.

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Schematic for the Auditory experiment (Blauert 1996)

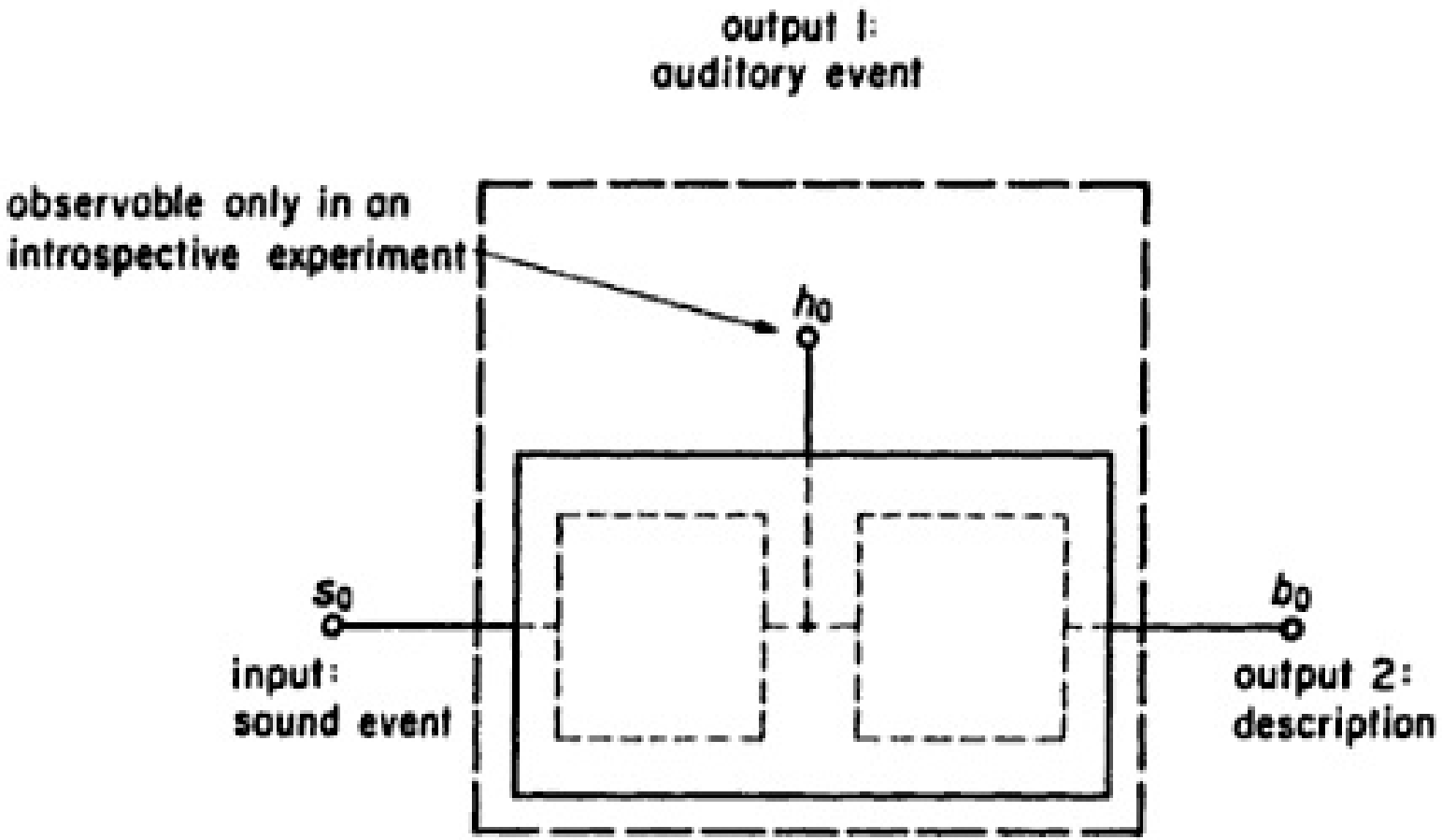

Figure 1.1
A simple schematic representation of the subject of an auditory experiment.

Measurement of the psychophysical function (Blauert 1996)

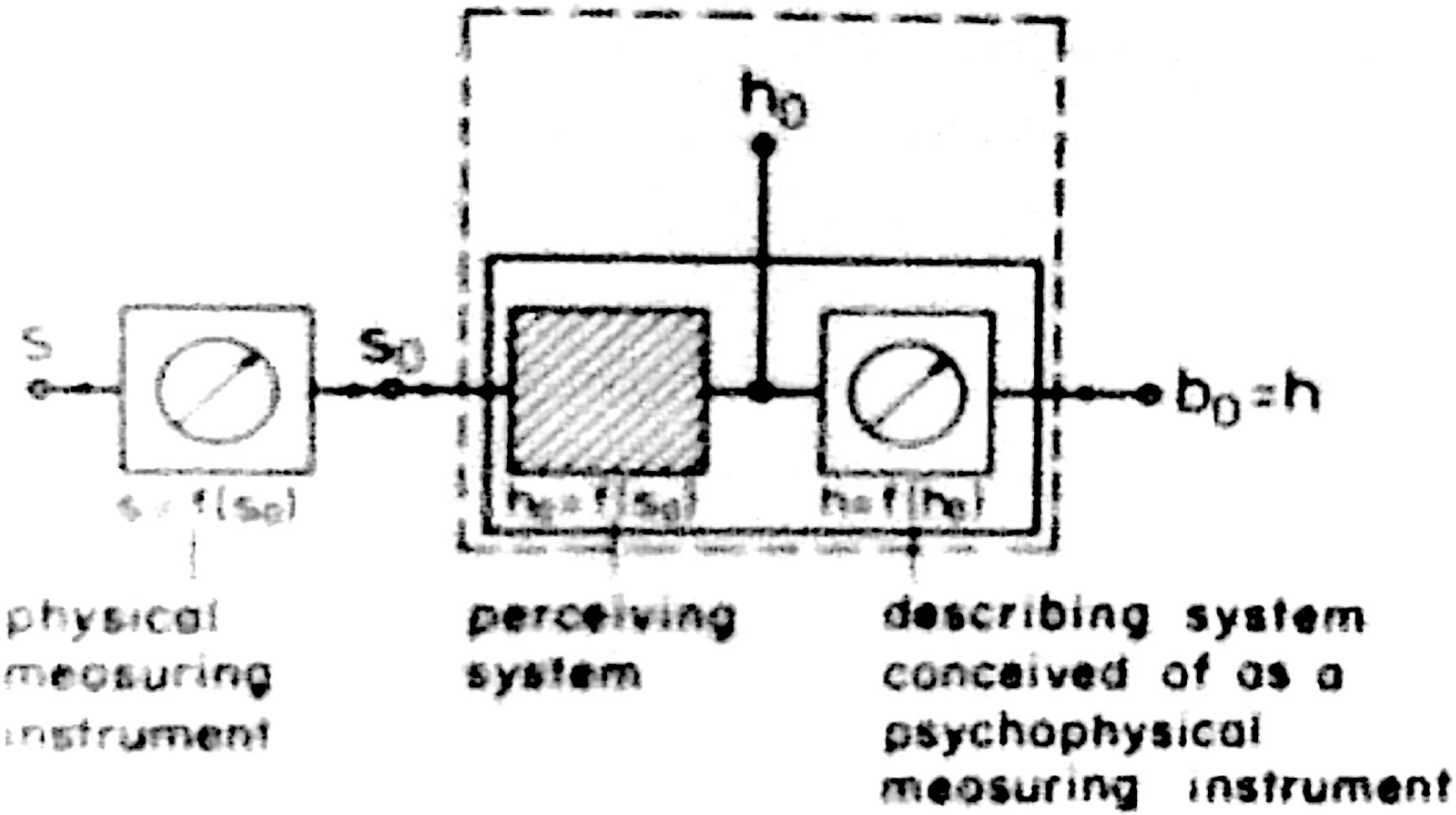

Figure 1.3
Measurement of the psychophysical function $h = f(s)$.

for next session

assignment

Think of an auditory experiment we could do next time on...

- Perception of distance of an auditory event
- Perception of room size by reverberation