

## Psychophysics

- What is psychophysics?
  - Psychophysics is the study of the relation between the **physical stimulus** causing the sensation and the **sensation** registered in the mind.

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## Psychophysics

- Want to know how sensitive someone is to stimuli?
- Do we mean?
  - threshold?
  - difference?

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## Sensory Abilities:

- Detection.
- Discrimination.
- Identification.
- Scaling.
- These four considered the content of Psychophysics.

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- POINT:

To study how we perceive things, we need to study the properties of the physical world, the properties of our sensory system, and the higher-level processing which allows us to interpret the symbolic signals.

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### Detection.

- ..determining the minimum amount of a particular stimulus that is required for the individual to say that a stimulus is present.
- The absolute threshold is *the threshold of stimulus energy above which the stimulus is detectable.*

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### Method of Constant Stimuli

- fixed set of stimuli chosen in advance
- each presented many times in a random order

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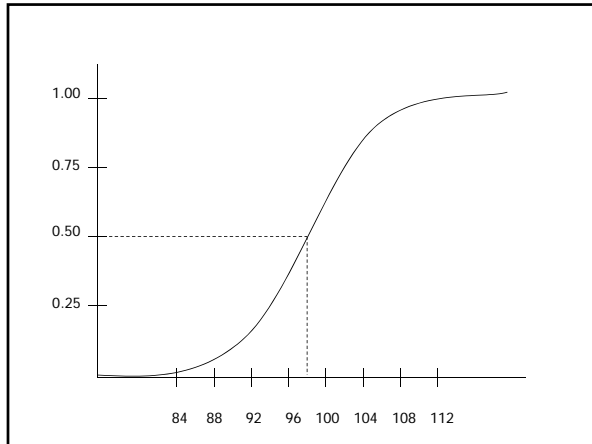
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**Method of Limits**

- ascending trials.
- descending trials.
- ERRORS.
  - Error of Preseverasion.
  - Error of Anticipation.
- Controlling for errors.

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**Problem--Background Noise**

- What is background noise?
  - variability
- How pervasive is it?
- Why don't we notice it?
  - evolution

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- POINT: All our sensory systems have evolved to account for the “spontaneous firing or resting rate” of our normally functioning neurons— meaning that our sensory systems are going to be more or less sensitive at different times.

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**Point:**

- The idea that a threshold could be “absolute” seems inconsistent with the evidence--a result of the structure of the human sensory system.

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**Signal Detection Theory**

- catch trials
- This tests:
  - a person’s ability to detect something
  - and that individual’s guessing behavior.
- How many possible outcomes?

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## 4 Possible Outcomes

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		Response	
		YES	NO
Stimulus	Present	<i>Hit</i>	<i>Miss</i>
	Absent	<i>False Alarm</i>	<i>Correct Rejection</i>

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## Signal Detection.

- noise distribution
- signal + noise distribution
- response criterion (Beta)
  - trade off -- false alarms and misses
- sensitivity ( $d'$ )

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- POINT: Signal Detection Theory means we can look at physical stimuli, the higher-order processes, and the sensory system all at once.

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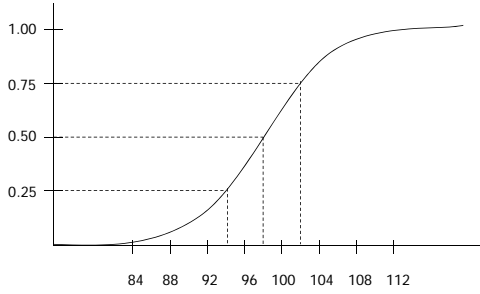
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## Discrimination

- Difference Threshold



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