Module 3: Sensation and Perception
Topic 1 Content: Sensory Thresholds Notes

Introduction

Sensory Thresholds

Click ***NEXT*** to begin.

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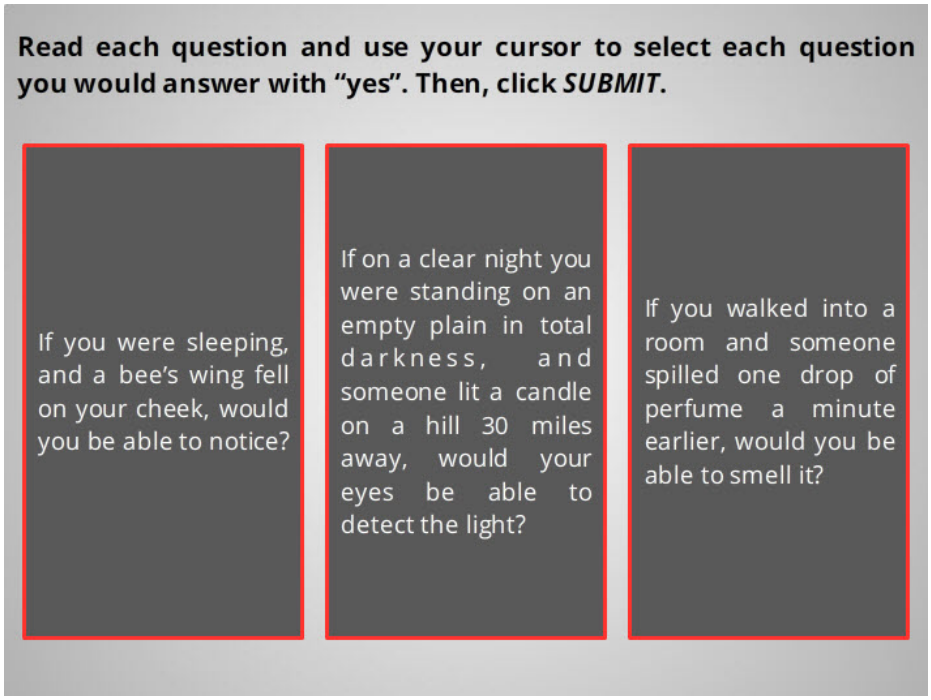
Detection Scenarios



Read each question and use your cursor to select each question you would answer with "yes." Then, click ***SUBMIT***.

Feedback: Under the correct conditions, most people would answer yes to these questions, but just barely. Just as you cannot detect every type of stimulus or energy, there are some external signals that are simply too small or faint for you to detect.

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Thresholds

Like in the scenarios just described, your senses are often capable of picking up very faint signals. However, even the best sensory systems have limits. Through the use of thresholds, you can measure the limits of sensory experiences.

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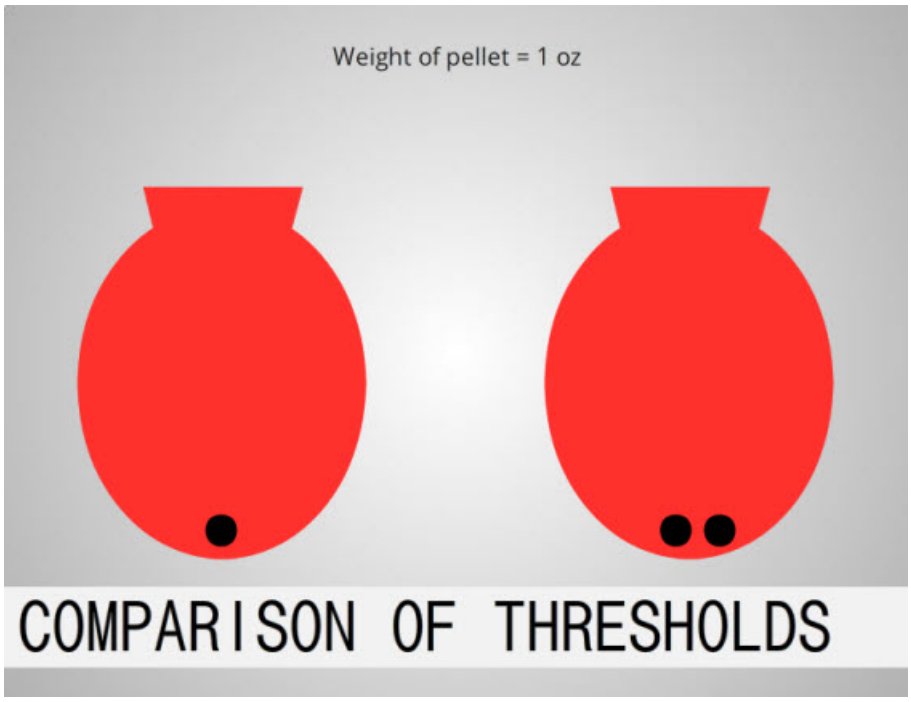
Absolute Thresholds

The first type of threshold is called the absolute threshold, and is the very smallest amount of stimulus needed to detect a particular signal. Since experience and sensory abilities can vary from person to person, to measure the absolute threshold for different stimuli, psychologists determine the smallest signal that a person can detect 50% of the time. Averaged together, those who have studied the field of psychophysics in depth have discovered the kinds of absolute thresholds mentioned in the previous examples of the bee's wing, lit candle, and the perfume drop.

Difference Threshold

The ability to detect a change in a stimulus is known as a *difference threshold*. Similar to the absolute threshold, the difference threshold is defined as the minimum amount of change in a stimulus that can be detected half of the time. The difference threshold is also sometimes called the *just noticeable difference*, or *jnd*. For example, if you are sitting in the back seat of a car with the stereo on, and the driver changes the volume just one notch, would you be able to tell if there had been a change?

Comparison of Absolute and Difference Threshold

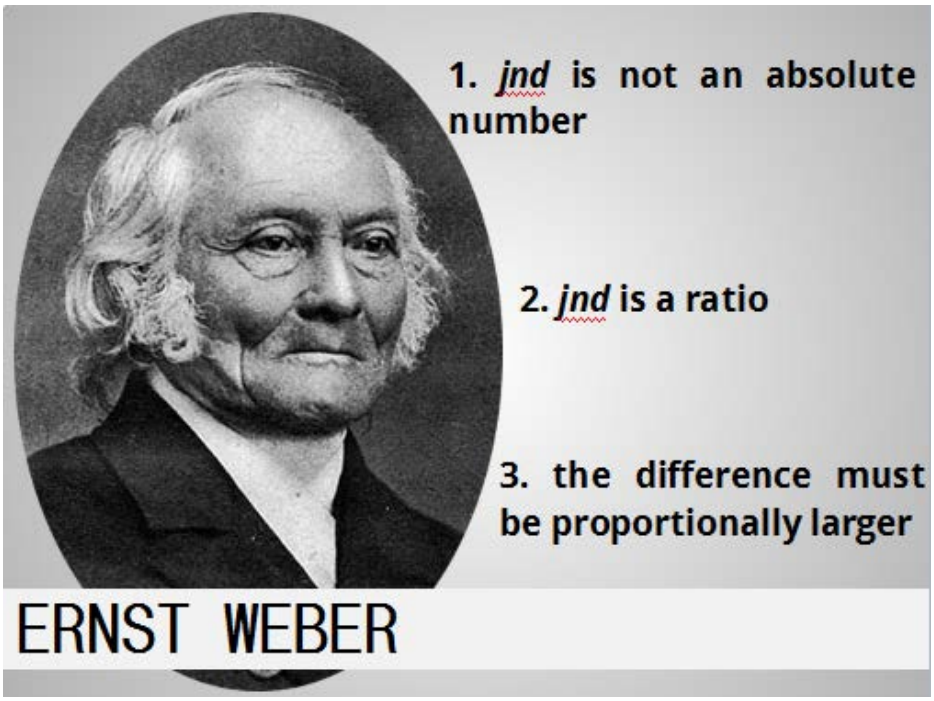


However, there is an important difference between the way in which the absolute threshold and the difference threshold is measured. In the case of absolute thresholds, the minimum stimulus needed for detection is expressed as an absolute number. Specifically, if you were trying to determine the absolute threshold of detection for weight, the number might be very small, perhaps only a fraction of an ounce. But to determine the difference threshold, or jnd for weight, we could not simply come up with a specific amount of weight, such as one ounce.

For example, imagine a deflated balloon has one small pellet inside that weighs one ounce. If someone handed you a second balloon with two pellets inside, would you be able to detect which balloon held more weight? In this case, you probably could do so. Now imagine that the balloons each hold forty and forty-one pellets, respectively. Could you determine which one had forty, and which had forty-one pellets just by holding them? Probably not!

In the example, the absolute threshold in weight between the first pair of balloons and the second pair of balloons was the same. Specifically, each was one ounce different from the other. Almost anyone could detect the difference between this pair of balloons, while very few people could reliably sense the difference between a balloon holding forty ounces of pellets and the balloon holding forty-one ounces.

Ernst Weber



German scientist Ernst Weber was the first person to notice this phenomenon: the difference between absolute and difference thresholds. Weber determined that the just noticeable difference for a given stimulus is not an absolute number, like one ounce or three pounds, but instead is a ratio. When comparing two strong stimuli, such as two very heavy weights, the difference between them needs to be proportionally larger for someone to be able to tell a difference. For very faint stimuli, however, even a small change might be easily detected.