Signal Detection Theory
Think, pair, share – quiz!!!

Signal detection theory argues that the idea of an absolute threshold for sensory systems doesn't really make sense. Whether or not we hear a sound (the signal) depends heavily on our attention and expectations at the time and how motivated we are to hear that sound.

When detecting a signal there are actually four possible scenarios. These four outcomes come from the fact that there are two possible realities [there was a sound (signal) or there was not a sound] and two possible beliefs or decisions on our part (we believe we heard a sound or believe we did not hear a sound.)

Each of the four outcomes has a name as shown in the chart below for the shower scenario:

You are taking a shower. The phone either rings or doesn't ring during that shower, and you either believe you hear the phone ring or do not believe you hear the phone ring.

		Reality; what really happened	
		Phone rings	Phone does not ring
Your decision about → what's real	You believe you hear ring	**Hit**	**False positive**
	You do not hear ring	**Miss**	**Correct rejection**

For the following scenarios either label or describe the outcomes that fit each possible combination of decision and reality (even though some don't strictly deal with sensation it helps you get the idea.)

1. first answer the questions for all 5 scenarios on your own
2. compare your answers with a partner and work out any disagreements
3. inform the instructor you are ready and take your quiz

1. You are a radiologist and are looking at a spot on an X-ray. The reality is that the spot is either cancer or not cancer. You will make a decision and your choices are either that you decide it is cancer or you decide it is not cancer. Label each of the following as either a **hit, miss, false positive, or correct rejection.**

___ you say it is cancer but it's not
___ you say its cancer and it is
___ you say it is not cancer and its not
___ you say it is not cancer but it is

Put a star next to the two that are considered mistakes. Which of those two possible mistakes would you rather your doctor make?

2. A man is on trial for murder. He either did kill someone or did not. The jury will decide if they think he is guilty (he did kill someone) or not guilty (did not kill). For each possible outcome write down the jury's decision and what the man really did.

Hit: _____
False Positive:_____
Correct Rejection:_____
Miss:_____

3. Your friend Shayna tells you Robert was talking badly about you behind your back. You are surprised and don't really want to believe this is true but you also don't want to be a sucker. You wonder about Shayna's intentions as well. Label the four possible outcomes.

_____ You believe Shayna but Robert did not talk badly about you
_____ You do not believe Shayna but Robert did talk badly about you
_____ You believe Shayna and its true, Robert talked badly about you
_____ (fill in what would happen for this last possibility, what did you believe and what did Robert do?)
_____
_____

4. Whether or not you have a HIT, MISS, etc now depends on how important each one is to you. For the shower scenario (the phone might ring) let's say on Monday when you take a shower you are not expecting anyone to call and on Friday you are expecting your friend to call you about weekend plans. On which day are you more likely to have false positives when you take a shower – Monday or Friday (circle one)?

5. If a person is being tested for hearing, and they have a lot of false positives (they say they hear a tone when none was played) how is that going to affect the number of Hits they have versus the number of Misses?

Once you have reviewed your answers with a partner you are ready for the quiz over this material.

Signal Detection Quiz

1. Signal detection theory argues that
    (A) there is no such thing as a difference threshold
    (B) absolute thresholds are the same for all sensory systems
    (C) deaf people are better at detecting dim light
    (D) the ability to detect sound depends on a person's motivation
    (E) static can easily overwhelm a radio signal

2. If a person detects a signal and the signal was actually there, this is known as a
    (A) miss
    (B) hit
    (C) false positive
    (D) incorrect rejection
    (E) correct rejection

3. You would predict that a person in a signal detection experiment who earns a dollar for every "Hit" is likely to
    (A) not be motivated to detect the signal
    (B) have a lot of false positives as well as hits
    (C) have a lot of misses as well as hits
    (D) not make very much money
    (E) increase the expectation of a signal with every dollar earned

4. Justin is waiting for his friend Tyler to show up for a movie and is looking for Tyler in the crowd. Justin is anxious because the movie is about to start so he's hoping Tyler shows up very soon. As Justin looks at faces in the crowd looking for Tyler, which of the following scenarios would represent a correct rejection?
    (A) Justin sees a face, decides it is not Tyler, but it is
    (B) Justin sees a face, decides it is Tyler, and it is
    (C) Justin sees a face, decides it is not Tyler, and it isn't
    (D) Justin sees a face, decides it is not Tyler, but still cannot tell if it is or isn't
    (E) Justin sees a face, decides it is Tyler, but it isn't