**Chapter 2**

**Research Methodology**

1. When using the Method of Limits to measure a threshold, the crossover point between detecting vs. not-detecting a threshold may be different for ascending and descending trials. Why do you think this happens? Researchers usually average together the results of ascending and descending trials. Do you think this is valid?

*Hints and discussion points: This discussion encourages students to think critically and scientifically about how to study sensory function. Students should center on adaptation and/or habituation as explanations of the differing results. Explain how adaptation results from the sensory organ getting “used” to a high level of stimulation (in the case of descending trials) and thus may not respond to weaker stimuli. Explain how habituation can result in participants giving the same response repeatedly and persisting with the response even when the stimulation has changed. Students can question whether the averaged result reflects a real threshold or only blurs out the real effects of adaptive processes in sensory function.*

1. Imagine you are a production manager for a bottling line at a large brewery. After the bottles are capped, they move down a conveyor to be packaged in cases to be shipped. One of your employees has the job of monitoring these bottles for defects, particularly in whether the cap was seated correctly (the capping machine may occasionally make mistakes such as skipping a bottle, putting two caps on one bottle, or seating the cap at the wrong angle so the bottle is not sealed properly). Consider what would happen if too many improperly capped bottles are shipped to retailers. In terms of signal detection theory, what kind of error is this? If you tell your employee to minimize this kind of error, what do you think will be the effects on her behavior?

*Hints and discussion points: This discussion encourages students to understand the processes at work in Signal Detection. The error described is a miss: bad bottles are mis-identified as good bottles and sent for shipping. If this results in many returns and a bad reputation for the brewery, the manager may tell the employee to be extra careful to catch all bad bottles. The employee in turn may change her response criterion to call out “bad” more often. This will reduce the miss rate, but may increase the false alarm rate. The instructor can lead discussion on what drawbacks may be associated with this new error.*

1. Weber invented the two-point threshold for measuring the smallest distance between two touches that can be reliably identified as two separate points on the skin. This methodology revealed that the ability to discriminate two points is better on the fingertips than on other parts of the body such as the legs or back. Why do you think this is the case?

*Hints and discussion points: Students may focus on the functional issues, namely that we touch things with our fingers/hands to obtain information about them, not with our legs or back. But why don’t we have an equally sharp sense of touch over the whole body? Discuss in terms of the amount of innervation the fingers require compared to the other body parts.*

1. Does it make sense to separately define the absolute threshold and difference threshold? Can you see how they might be the same?

*Hints and discussion: This follows Fechner’s logic that the absolute threshold was just a jnd relative to zero stimulation, and that all jnd’s were equal units of sensation, with the absolute threshold at the bottom of the scale.*