

# Part 1: The Somatic Senses

## A. Touch Threshold

By using a bristle, it is possible to touch various points on the skin and find that in some places a touch will be felt and in others, it will not. The skin possesses about half a million nerve endings for touch or pressure and three million for pain.

Procedure:

Students should work in teams of two.

1. One student should mark off a square 4 cm on each side on the ventral surface of the wrist & heel of the hand. On the lab sheet, you will find a similar shaped diagram of identical dimensions.
2. He then should rest his hand, palm side up on the table. Their eyes must be closed.
3. The partner of the above student should explore the marked off area with the tip of a bristle that is pressed against the skin just enough to cause it to bend each time. The pressure should be applied in the same manner each time.
4. The student being tested should indicate when the sensation of touch is experienced and his partner should record on the paper in the proper location the corresponding points at which the sensations are felt. (+ = felt it, - = did not)
5. After the area has been thoroughly explored, students should exchange roles and repeat the procedure.

## B. Pain Sensation

1. Using the same area marked off on the wrist, draw another identical diagram on the lab sheet.
2. Place the point of a straight pin to the surface of the skin and press enough to produce a sensation of pain. BE CAREFUL NOT TO PUNCTURE THE SKIN.
3. Explore the area in a systematic manner, recording on the paper, and the locations of the points that give pain sensation when stimulated (+ = felt it, - = did not). Students should be able to distinguish between sensations of touch and pain.

## D. Two-Point Threshold

The capacity of a sensory surface for recognizing patterns is measured by determining the "two-point threshold," which is the smallest separation at which two point stimuli are perceived as two. This measures the density of receptors, since for two stimuli to be appreciated as two, they must stimulate two touch spots having at least one unstimulated touch spot between them.

The following exercises should be performed in pairs; one student with eyes closed during the test, serving as the subject, the other as experimenter and recorder.

Procedure:

1. To test for the two-point threshold, the experimenter touches various points in a region of skin very lightly with one or both of the points of a pair of scissors.
2. At each touch, the subject reports the sensation as either "one" or "two."
3. At the start of each test adjust the separation of the points so that all double stimuli are reported as "two" and all single stimuli as "one."
4. Then gradually lessen the separation until only about 8 in 10 reports are correct. The separation of the points in centimeters is then the approximate minimum perceptible separation or two-point threshold. In some areas of the skin this is much the same in all orientations of the dividers; in others, it differs greatly.

5. Determine, and record in a table, the two-point thresholds for the lateral surface of the upper arm, ventral surface of forearm, the back of the calf, the center of the forehead, the back of the shoulder, back of hand, palm of hand, fingertips, lips, and back of neck.

### C. Sensory Adaptation

1. Hold the weight in your hand until it has warmed to skin temperature.
2. Place one of the weights on your forearm and let it remain for a couple of minutes. Your forearm must remain perfectly motionless.
3. Pay close attention to the sensation of the weight on your arm. How long did you sense the presence of the weight on your arm?
4. Now, using the attached tape, remove the weights and record the sensation you experience.

### E. Shifting of physiological zero

Thermal receptors (Ruffini's organ for heat, Krause's bulb for cold) respond to changes in temperatures rather than a fixed value of temperature. Both types of thermal receptors adapt moderately to new levels of temperature.

1. Place the index finger of the right hand in 40°C water and the index finger of the left hand in 20° C water for two minutes.
2. Then, place both fingers simultaneously in 30o C water. Record your perception of the temperature of this water.

