Ernst Weber (1795–1878)

Weber was a physiologist who developed an interest in the senses of touch and of kinesthesis (Hergenhahn, 2001). He demonstrated that touch is composed of three qualities: temperature, pressure, and pain. Using a device similar to a compass (the technological drawing instrument), he attempted to assess the smallest spatial separation between two points that could be discriminated when touching the body—the *two-point threshold*. The smallest threshold (greatest sensitivity) was at the tongue (1 mm.) and the greatest was along the middle of the back (60 mm.). Weber reasoned that this was due to differences in anatomical arrangement of sensory receptors (more receptors = greater sensitivity).

In his work on kinesthesis (sensations of movement and muscle strain) Weber investigated the capacity to discriminate between weights of varying magnitudes. The smallest detectable difference between two weights depended on how large the weights were. Sensitivity was based upon a ratio of the two. His procedure involved participants lifting a constant standard weight and comparing other weights to the standard. Their task was to indicate if the same or different (heavier or lighter). This led to the concept of *just noticeable differences*. There were two conditions: 1) weights placed upon hands resting on a table (tactile sensations alone), or 2) weights lifted (tactile and kinesthetic sensations). Smaller differences could be detected in the lifting condition. Greater sensitivity was due to the additional sense. Weber's work would inspire a contemporary—Gustav Fechner—to develop it further and christen the discipline of psychophysics.

Reference

Hergenhahn, B. R. (2001). *An introduction to the history of psychology* (4th ed.). Belmont, CA: Wadsworth/Thomson Learning.