CONTEXT EFFECTS AND BIASES IN SENSORY JUDGMENT

By such general principles of action as these, everything looked at, felt, smelt or heard comes to be located in a more or less definite position relatively to other collateral things either actually presented or only imagined as possibly there.—James, 1913, p. 342

RELATIVE NATURE OF RATING SCALES

An axiom of perceptual psychology has it that human beings are very poor absolute measuring instruments but are very good at comparing things. For example, we have trouble estimating either the sweetness level of a single solution or its physical concentration (should we be trained to think in physical units?), but we have little trouble in telling whether more sugar has been added to the coffee. The question then arises: If people are so prone to making comparisons, how do they judge sensory intensity when no comparison is explicitly requested? For example, when asked to rate the perceived firmness of a food sample, how do they judge what is firm vs. what is soft? Obviously, they must either choose a reference for comparison, form a frame of reference for the range of firmness to be judged, or be trained with explicit reference standards to understand what is high and low on the response scale. For many items encountered in everyday life, we have established frames of reference based on experience for how magni-
tudes, extent, or intensities are to be compared. We have no trouble with the image of a large mouse running up the trunk of a small elephant because we have established frames of reference for what constitutes the average mouse and the average elephant.

This dependence on a frame of reference in making sensory judgments demonstrates the influence of contextual factors in biasing or changing how products are evaluated. We are always prone to see things against a background and evaluate them accordingly. A 40-degree (Fahrenheit) day in Ithaca, New York, in January, seems quite mild against the background of the northeastern American winter. However, the same 40-degree temperature will feel quite cool on an evening in August in the same location. This principle of frame of reference is the source of many visual illusions, where the same physical stimulus causes very different perceptual impressions, due to the context within which it is embedded. Examples are shown in Figure 9.1.

A simple demonstration is the visual afterimage effect that gave rise to Emmert's law (Boring, 1942). In 1881, Emmert formalized a principle of size constancy based on the following effect: Stare for about 30 seconds at a brightly illuminated colored paper rectangle (it helps to have a small dot to aid in fixation in the center) about a meter away. Then shift your gaze to a white sheet on the table in front of you. You should see the rectangle afterimage in approximately a complementary color and somewhat smaller in size as compared to the original colored rectangle. Finally, shift your gaze to a white wall some distance off. The afterimage will now appear much larger, as the brain finds a fixed visual angle at greater distance to represent larger physical objects. Since the mind does not immediately recognize that the afterimage is just a creation of the visual sensory system, it projects it at the distance of the surface on which it is “seen.” The more distant frame of reference, then, demands a larger size perception.

Considering that the frame of reference of the judge and the context of the evaluation session are important parts of collecting good sensory judgments, Anderson (1974), for example, in discussing the use of category scales gives the following advice:

Several precautions have been standard with ratings scales in functional measurement. First is the use of preliminary practice, which has several functions. The general range of stimuli is not known to the subject initially, and the rating scale is arbitrary. Accordingly, the subject needs to develop a frame of reference for the stimuli and correlate it with the given response scale (emphasis added; pp. 231–232).

Anderson goes on to note that the visible effect of such practice is a decrease in variability. This practice in the psychological laboratory for stabi-