



Standard Terminology Relating to Sensory Evaluation of Materials and Products¹

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1. Referenced Documents

1.1 *ASTM Standards*:²

E284 Terminology of Appearance

2. Terminology

absolute judgment, *n*—an evaluation of a stimulus made without direct comparison to other stimuli. (2007)

acceptability/unacceptability, *n*—degree to which a stimulus is judged to be favorable or unfavorable. (2006)

acuity, *n*—the ability to detect or discriminate sensory stimuli. (2007)

adaptation, sensory, *n*—a decrease in sensitivity to a given stimulus which occurs as a result of exposure to that stimulus. (2006)

affective test, *n*—any method to assess acceptance, liking, preference, or emotions for a stimulus or stimuli. (2008)

after effects, *n*—total array of sensations that occur after removal of the stimulus from the sensing field (for example, with foods) or after application of the stimulus (for example, with non-foods). (2008)

after feel, *n*—feel of the skin after application of a sample, with or without touching, usually measured at a specified time point. (2008)

aftertaste, *n*—the oral or nasal sensations that occur after the stimulus has been removed from the oral cavity. See **after effects**. (2007)

agusia, *n*—lack of sensitivity to taste stimuli. (1996)

alternative forced choice (AFC), *n*—method in which 2, 3, or more stimuli are presented, and assessors are given a criterion by which they are required to select one stimulus. (2008)

DISCUSSION—Typical examples include 2-AFC (directional different test) and 3-AFC (selecting the one stimulus among a set of three that differs in a defined attribute).

alternative forced choice (AFC) test, *n*—method in which 2, 3, or more stimuli are presented, and assessors are given a criterion by which they are required to select one stimulus. (2008)

DISCUSSION—Typical examples include 2-AFC (directional difference test) and 3-AFC (selecting the one stimulus among a set of three that differs in a defined attribute).

anchoring point, *n*—a reference point against which other items are judged. (1996)

anosmia, *n*—lack of sensitivity to odor stimuli. (1996)

A-not-A test, *n*—a method of discrimination testing comprised of at least two samples; at least one sample is a previously identified sample (“A”) and at least one is a test sample. All samples are presented blindly, and the assessor’s task is to assign the label “A” or “not-A” to each of the samples. (2001)

antagonism, *n*—joint action of two or more stimuli whose combination elicits a level of sensation lower than that expected from combining the effects of each stimulus taken separately. (1996)

aroma, *n*—perception resulting from stimulating the olfactory receptors; in a broader sense, the term is sometimes used to refer to the combination of sensations resulting from stimulation of the entire nasal cavity. (1996)

DISCUSSION—Aroma, odor, and smell have the same basic meaning; however, in common usage they may have different connotations.

aromatic, *n*—perception resulting from stimulating the olfactory receptors retronasally. (2010)

assessor, *n*—a general term for any individual responding to stimuli in a sensory test. (2006)

DISCUSSION—The terms *assessor*, *judge*, *panelist*, *panel member*, and *respondent* all have the same basic meaning, although sometimes different connotations. Usage of these terms varies with the training and experience of the investigator, habit, tradition, personal preference, and other factors.

astringency, *n*—the complex of sensations due to shrinking, drawing, or puckering of the epithelium as a result of exposure to substances such as alums or tannins. (1996)

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard’s Document Summary page on the ASTM website.

attitude, *n*—a predisposition to respond in a characteristic way toward a class of objects, concepts, or stimuli. (1996)

attitude scale, *n*—a means for eliciting indications of the attitudes or opinions held, usually on a measuring system using marks or value designations. (1996)

attribute, *n*—a perceived characteristic. (1996)

audition, *n*—the sense of hearing. (1996)

aversion, *n*—a predisposition to avoid a stimulus based on a feeling of discomfort or dislike. (2011)

bias, *n*—a systematic error manifested as a persistent positive or negative deviation of the method average from its accepted true value. (2013)

DISCUSSION—Bias is a general term for any systematic deviation in a method's average from its accepted true value. In sensory, there are several commonly used terms that relate to specific types or causes of bias. These include: sensory adaptation, context effect, contrast effect, convergence effect, error of expectation, order effect, position effect, and response bias.

bipolar scale, *n*—scale where the end anchors are semantic opposites and there is an implied or anchored mid-point. (2008)

DISCUSSION—Examples of semantic opposites are “too thin” to “too thick,” “dislike extremely” to “like extremely.”

bite, chemical, *n*—stinging experienced primarily in the oral cavity as a result of exposure to substances such as highly carbonated beverages. (1997)

bitter, *adj*—pertaining to the taste produced by substances such as quinine or caffeine when in solution. (2012)

blinded, *adj*—an element of experimental control in which the identity or an aspect of a treatment, condition, or substance is hidden from the participant (single blind) or both the participant and the experimenter (double blind). (2008)

body (food), *n*—the quality of a food or beverage relating either to its consistency, compactness of texture, fullness, flavor, or combination thereof. (1997)

brightness, *n*—see **color** (*of an object*). (2001) (For consensus technical definition see **brightness** in Terminology E284).

burn, chemical, *n*—perception of irritation resulting from exposure to substances such as ethyl alcohol, acetic acid, and benzoate. The sensation tends to persist after the stimulus is removed. (2013)

chroma, *n*—see **color**. (2001) (For consensus technical definition see **chroma** in Terminology E284).

color (of an object), *n*—the appearance of an object dependent upon the spectral composition of radiant and incident light, the spectral reflectance or transmittance of the object, and the psychological response of the observer. The experience may be described in terms of three attributes: hue, brightness, and chroma. (2001) (For consensus technical definition see **color** in Terminology E284 as defined by Committee E12.)

hue—attribute of color related to the wavelength of electromagnetic energy and experienced as “red,” “green,” “blue,” and other elements of the visible spectrum.

brightness—aspect of visual perception whereby an area appears to emit more or less light.

chroma—experienced as color purity, attribute of color used to indicate the degree of departure of the color from a gray of the same brightness.

color blindness, *n*—total or partial inability to differentiate certain hues. (1997)

consumer, *n*—the user or potential user of a product or service, who may participate in research tests to provide opinions of products, concepts or services. (2010)

context effect, *n*—effect upon the perception of a stimulus arising from its interrelationship with other stimuli in a presentation set. (1997)

contrast, visual, *n*—the degree of dissimilarity in appearance of two parts of a field of view seen simultaneously or successively. (1998)

contrast effect, *n*—special case of context effect in which the perceived degree of difference between stimuli is exaggerated as a result of their interrelationship. (1997)

convergence, *n*—tendency of a stimulus to be perceived as similar to prior stimulus or stimuli. (1997)

convergence effect, *n*—special case of context effect in which the perceived degree of difference between stimuli is diminished as a result of their interrelationship. (1997)

cooling, chemical, *n*—sensation of reduced temperature experienced as a result of exposure to certain substances such as menthol or anise. The sensation usually persists after the stimulus is removed. (1997)

cooling, physical, *n*—sensation of reduced temperature experienced as a result of exposure to thermally cold substances, such as ice; to substances that evaporate rapidly, such as acetone or alcohol; or to substances that have a negative heat of solution, such as crystalline sorbitol. The duration of the sensation is usually limited to the time of direct contact with the stimulus. (1998)

cutaneous sense, *n*—any of the senses whose receptors lie in the skin or immediately beneath it (or in the external mucous membranes): contact, pressure, warmth, cold, and pain. (1997)

descriptive analysis, *n*—any method to describe and quantify the sensory characteristics of stimuli by a panel of trained assessors. (1998)

difference limen, *n*—See **threshold, difference**. (1997)

directional difference test, *n*—a paired comparison or 2-AFC (Alternative Forced Choice) method in which assessors select the stimulus from a pair of stimuli that is perceived to be higher or lower in intensity of a specified sensory attribute. (2009)

discrimination, *n*—the process of qualitatively or quantitatively differentiating among stimuli. (1998)

discrimination test, *n*—any method to determine if differences among stimuli are perceptible. For example: triangle tests, duo-trio tests, paired comparison tests, etc. (1998)

duo-trio test, *n*—a method of discrimination testing comprised of two coded samples and one identified reference. One of the coded samples and the reference are samples of the same stimulus. The other coded sample is a sample of one other stimulus. The assessor is asked to select which of the two coded samples is different from the reference or which of the two coded samples is the same as the reference. (2012)

DISCUSSION—Stimuli can represent different lots of products, formulations, or processes, etc.

expectation, error of, *n*—a bias due to preconceived ideas that influences an assessor's judgment. (1999)

expert, *n*—a common term for a person with extensive experience in a product category who performs perceptual evaluations to draw conclusions about the effects of variations in raw materials, processing, storage, aging, etc. Experts often operate alone. (1995) (See also **assessor** and **expert assessor**.)

expert assessor, *n*—an assessor with a high degree of sensory acuity who has experience in the test procedure and established ability to make consistent and repeatable sensory assessments. An expert assessor functions as a member of a sensory panel. (1995) (See also **assessor** and **expert**.)

extended use testing, *n*—sensory or consumer testing of a product over a time period that allows for multiple usage occasions.

flavor, *n*—(1) perception resulting from stimulating a combination of the taste buds, the olfactory organs, and chemesthetic receptors within the oral cavity; (2) the combined effect of taste sensations, aromatics, and chemical feeling factors evoked by a substance in the oral cavity. (2001)

fragrance, *n*—(1) see **aroma**; (2) an aromatic substance. (2011)

DISCUSSION—The term fragrance is commonly used in household and personal care industries.

free-choice profiling, *n*—a form of sensory profiling in which each assessor independently generates attributes to evaluate a group of samples. The assessors' attributes may be the same or may differ from sample to sample. The assessors' sensory profiles are combined statistically (for example, by Generalized Procrustes Analysis) to produce a map of the samples. (2000)

gloss, *n*—a shiny appearance resulting from the tendency of a surface to reflect light energy at one angle more than at others. (2000) (See **reflectance**, **directional**. For the consensus technical definition, see **gloss** in Terminology E284.)

gustation, *n*—the sense of taste. (2011)

heat, chemical, *n*—sensation of increased temperature resulting from exposure to substances such as capsaicin or hot peppers. The sensation tends to persist after the stimulus is removed.

heat, physical, *n*—sensation experienced as a result of exposure to thermally hot substances such as water above 120°F. The duration of the sensation is usually limited to the time of direct contact with the stimulus.

hedonic scale, *n*—a scale on which liking or disliking of a stimulus is expressed. (2000)

hue, *n*—see **color** (*of an object*). (2001) (For consensus technical definition see **hue** in Terminology E284.)

inadequate stimulus, *n*—a stimulus which is not regarded as normally affecting a particular sense, but which may actually do so (for example, pressure on the eyeball producing a perception of light, or electrical stimulation generating a taste). (2000)

intensity, *n*—the perceived magnitude of a stimulus. (2000)

judge, *n*—See **assessor**. (2000)

just-about-right scale, *n*—bipolar scale used to measure the level of an attribute relative to an assessor's ideal level, having a midpoint labeled "just about right" or "just right." (2007)

just noticeable difference, *n*—See **threshold, difference**. (2000)

kinesthesia, *n*—perception of pressure, position, or motion in muscles, tendons, or joints. (2001)

magnitude estimation, *n*—process of assigning values to the intensities of an attribute in such a way that the ratios between pairs of assigned values are the same as between the magnitudes of the perceptions to which they correspond. (2003)

malodor, *n*—an odor that is unpleasant or disliked when perceived in a specific context. (2012)

DISCUSSION—For example, "sweaty" is considered a malodor by many people when it is present on the human body. However, "sweaty" notes are common in many cheeses and may not be considered malodor in that context.

masking, *n*—the phenomenon where one quality within a mixture obscures one or several other qualities present. (2001)

matching, *n*—the process of equating or relating stimuli, usually to determine the similarity between standard and unknown or between unknowns. (2002)

modality, *n*—any of the sensory systems (for example, auditory, taste, olfaction, touch, or visual modality). (2001)

mouthfeel, *n*—a mixed experience deriving from sensations in the oral cavity that relate to physical (for example, density, particulate) or chemical (for example, astringency, menthol cooling) properties of a stimulus material. (2001)

observer, *n*—(1) an assessor in a visual sensory test. (See also **assessor**.) (2) a person who is watching an individual or group to collect information about behavior, responses to products, test protocols, or processes. (2002)

odor, *n*—See **aroma**. (2001)

odorant, *n*—a substance that stimulates the olfactory receptors. (2002)

olfaction, *n*—the sense of smell. (2011)

olfactory, *adj*—pertaining to the sense of smell. (2001)

order effect, *n*—sequential effects in which one order of evaluating two or more stimuli produces different responses than another order. (2008)

organoleptic, *adj*—relating to a property of a sample perceived by the sense organs (obsolete, see **sensory**). (2001)

paired comparison, *n*—a method in which stimuli are presented in pairs for comparison on the basis of some defined criterion. (2001)

palatable, *adj*—sufficiently pleasant to be consumed. (2003)

panel, *n*—a group of assessors chosen to participate in a sensory test. (2001)

panelist, *n*—See **assessor**. (2001)

panel member, *n*—See **assessor**. (2001)

partial sensory profile, *n*—a profile comprising certain selected attributes with their intensity values. Examples are flavor profile, odor profile, and texture profile. (2001)

perception, *n*—the awareness of a stimulus by way of the senses. (2003)

position effect, *n*—bias occurring as a function of the evaluation of stimuli in the first, second, or third, etc. place or position. (2008)

DISCUSSION—For example, a first position, or primacy effect is bias related to the evaluation of treatments presented first; alternatively, a recency effect is bias related to treatments presented last.

preference, *n*—choice of one product, treatment, or item over others in a given set based upon hedonics, sensory properties, or other criteria. (2003)

psychometrics, *n*—application of measurement principles to psychological phenomena. (2003)

psychophysical methods, *n*—procedures for establishing relationships between measurable physical stimuli and resulting sensory responses. Some examples of these methods are the method of limits, method of constant stimuli, and the method of adjustment. (2003)

psychophysical power law, *n*—a power function describing the relationship between physical amounts of stimuli and their respective perceived intensities. (2003) The mathematical relationship is:

$$R = kS^n$$

where:

R = perceived intensity of a given stimulus,

S = physical amount of that stimulus,

k = constant reflecting the unit of measurement, and

n = exponent that is an empirical constant characteristic of the given sensory system.

pungency, *n*—irritating, piercing, or sharp trigeminal sensation, experienced primarily in the nasal cavity, as a result of exposure to ammonia or to the volatiles of such substances as freshly prepared mustard or horseradish. (2002)

qualitative reference, *n*—product that is used to demonstrate a specific sensory attribute.

qualitative sensory profile, *n*—a description of a sample consisting of sensory attributes, but without intensity values.

quality, *n*—collection of features and characteristics of a product, process, or service that defines its ability to satisfy stated or implied needs or requirements. (2003)

quantitative reference, *n*—a product that is used to represent the specific intensity of a sensory attribute on a scale. (2010)

quantitative sensory profile, *n*—description of a sample consisting of both sensory attributes and their intensity values. (2003)

ranking, *n*—a method in which an assessor arranges a set of samples in order of a defined criterion. (2004)

receptor, *n*—a cellular structure that mediates the physiological response to the presence of physical or chemical agents. (2003)

reference sample, *n*—a sample designated as the one to which all others are to be compared. (2003)

reflectance, diffuse, or Rd, *n*—a type of reflectance wherein, on an uneven surface, the angle of reflection is random and independent of the angle of incidence. This is in contrast to directional reflectance where the incident light is reflected in a specific direction that is dependent upon the angle of incidence giving the surface a glossy appearance. (2003)

reflectance, directional, *n*—light energy reflected from a surface at a specified, characteristic angle at greater intensity than at other angles. (2003)

respondent, *n*—See **assessor**. (2003)

response bias, *n*—the tendency or predisposition of an assessor to select a certain response independent of the stimulus. (See also **bias**.) (2012)

salty, *adj*—pertaining to the taste produced by substances such as sodium chloride when in solution. (2012)

sample, *n*—(1) unit of product, as prepared, presented, and evaluated by the assessor (see **stimulus**); (2) subset of units from the total population of product that is included in a test; (3) subset of individuals from a target population who are assessors in a test.

DISCUSSION—Statistically, a sample is the portion of a target population that is studied in order to learn about the population as a whole. The sample can be a sample of product or a sample of assessors.

saturation (in color), *n*—another term for **chroma**. See **color**. (2001)

scent, *n*—see **fragrance**. (2011)

screening, *n*—a preliminary procedure to select assessors, samples, products, or variables. (2003)

sensitivity, *n*—ability to perceive, identify, or differentiate one or more stimuli by means of the senses. (2004)

sensory, *adj*—pertaining to the senses. (2003)

sensory evaluation, *n*—a scientific discipline used to evoke, measure, analyze, and interpret reactions to stimuli perceived through the senses. (2000)

sensory panel, *n*—a group of assessors used to obtain information concerning the sensory properties of stimuli. (2004)

sensory profile, *n*—a description of the sensory attributes of a sample (sometimes in the order of perception) and with assignment of an intensity value for each attribute. (2005)

smell, *n*—See **aroma**. (2004)

sour, *adj*—pertaining to the taste produced by substances such as citric acid when in solution. (2012)

stimulus, *n*—something used to elicit a sensory response. (2004)

subject, *n*—(1) see **assessor**. (2) the individual to whom the stimulus is applied. (2010)

DISCUSSION—The subject and the assessor may not always be the same individual. In most food and beverage evaluations, the subject and the assessor are the same person. In many personal care evaluations the subject and the assessor may be different people. For example, in a study of shampoo, the subject is the person to whom the shampoo is applied while the assessor is a different person who evaluates the sensory properties of the shampoo on the subject's hair. In some applications, the subject may not be a person, such as in the evaluation of pet care products.

subthreshold, *adj*—pertaining to a stimulus below a specified threshold. (2005)

suprathreshold, *adj*—pertaining to a stimulus above a specified threshold. (2005)

sweet, *adj*—pertaining to the taste produced by substances such as sucrose when in solution. (2012)

synergism, *n*—the combination of two or more stimuli to produce an effect greater than the sum of their individual effects. (2004)

taint, *n*—a taste or odor foreign to a product, usually the result of spoilage or contamination. (2004)

taste, *n*—perception resulting from stimulating the gustatory receptors in the taste buds. (2004)

tetrad test, *n*—a method of discrimination testing comprised of four coded samples: two of which are samples of the same

stimulus and the other two are samples of one other stimulus. The assessor is asked to determine which two samples are different from the other two. (2012)

DISCUSSION—Stimuli can represent different lots of products, formulations, or processes, etc.

texture, *n*—the rheological and structural (geometric and surface) attributes of a product perceptible by the kinesthetic, tactile, visual, and auditory senses. (2005)

threshold, absolute, *n*—See **threshold, detection**. (2004)

DISCUSSION—Early literature used this term inconsistently, referring to either the detection or the population threshold.

threshold, detection, *n*—the lowest physical intensity of a stimulus that is perceived by an assessor a specified percentage of time, usually 50 %. (2004)

threshold, difference, *n*—the minimum difference in physical intensity between a stimulus and a comparison stimulus for which there is a specified probability that an assessor will perceive the two stimuli as different. Typically, the threshold is the difference that is detected 50 % of the time. The difference threshold is often called the difference limen (DL) or the just noticeable difference (JND). (2005)

DISCUSSION—The value of the difference threshold might depend on the assessor, the intensity of the reference stimulus, and the value chosen for the above-mentioned probability. (2005)

threshold, population, *n*—the median or other measure of central tendency of the distribution of detection or recognition thresholds for a specified population. (2004)

threshold, recognition, *n*—the lowest physical intensity at which a stimulus is correctly identified by an assessor a specified percentage of the time, usually 50 %. (2004)

threshold, terminal, *n*—(1) the maximum intensity of a stimulus that will produce a given type of sensory experience without change in modality. (2) the intensity of stimulation above which increase in intensity cannot be detected. (2004)

time-intensity method, *n*—a procedure for measuring the intensity of one or more sensory sensations over time. (2009)

trained assessor, *n*—an assessor with an established degree of sensory acuity who has experience with the test procedure and an established ability to make consistent and repeatable sensory assessments. (See also **assessor** and **expert**.) (2005)

DISCUSSION—A trained assessor functions as a member of a sensory panel.

transmittance, *n*—*of light*, that fraction of the incident light of a given wavelength that is not reflected or absorbed, but passes through a substance. (2004)

triangle test, *n*—a method of discrimination testing comprised of three coded samples: two are samples of the same stimulus and one is a sample of another stimulus. The assessor is asked to select the one sample that is different from the other two. (2012)

DISCUSSION—Stimuli can represent different lots of products, formulations, or processes, etc.

two-of-five test, *n*—a method of discrimination testing comprised of five coded samples: two of which are samples of

the same stimulus and three are samples of one other stimulus. The assessor's task is to determine which two samples are different from the other three. (2012)

DISCUSSION—Stimuli can represent different lots of products, formulations, or processes, etc.

two-point threshold (touch), *n*—the minimum distance between two tactile points when such points are correctly

reported as two separate points for a specified percentage of evaluations, usually 50 %. (2008)

umami, *n*—a basic taste sensation stimulated by substances such as monosodium glutamate, and nucleotides.

vision, *n*—the sense of sight. (2005)

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