



Standard Test Method for Unipolar Magnitude Estimation of Sensory Attributes¹

This standard is issued under the fixed designation E1697; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

^{ε1} NOTE—Editorially corrected 11.3 and changed “panelist” to “assessor” throughout in August 2012.

1. Scope

1.1 This test method describes a procedure for the application of unipolar magnitude estimation to the evaluation of the magnitude of sensory attributes. The test method covers procedures for the training of assessors to produce magnitude estimations and statistical evaluation of the estimations.

1.2 Magnitude estimation is a psychophysical scaling technique in which assessors assign numeric values to the magnitude of an attribute. The only constraint placed upon the assessor is that the values assigned should conform to a ratio principle. For example, if the attribute seems twice as strong in sample B when compared to sample A, sample B should receive a value which is twice the value assigned to sample A.

1.3 The intensity of attributes such as pleasantness, sweetness, saltiness or softness can be evaluated using magnitude estimation.

1.4 Magnitude estimation may provide advantages over other scaling methods, particularly when the number of assessors and the time available for training are limited. With approximately 1 h of training, a panel of 15 to 20 naive individuals can produce data of adequate precision and reproducibility. Any additional training that may be required to ensure that the assessors can properly identify the attribute being evaluated is beyond the scope of this test method.

2. Referenced Documents

2.1 ASTM Standards:²

E253 Terminology Relating to Sensory Evaluation of Materials and Products

E1871 Guide for Serving Protocol for Sensory Evaluation of Foods and Beverages

2.2 ASTM Publications:³

Manual 26 Sensory Testing Methods, 2nd Edition
STP 758 Guidelines for the Selection and Training of Sensory Panel Members

2.3 ISO Standards:⁴

ISO 11056:1999 Sensory Analysis—Methodology—Magnitude Estimation Method

ISO 4121:1987 Sensory Analysis—Methodology—Evaluation of Food Products by Methods Using Scales

ISO/DIS 5492:1990 Sensory Analysis—Vocabulary (1)

ISO 6658:1985 Sensory Analysis—Methodology—General Guidance

ISO/DIS 8586-1:1989 Sensory Analysis—Methodology—General Guide for Selection, Training and Monitoring Subjects—Part 1: Qualifying Subjects (1)

ISO 8589:1988 Sensory Analysis—General Guidance for the Design of Test Rooms

3. Terminology

3.1 Definitions:

3.1.1 *external modulus*—number assigned by the panel leader to describe the intensity of the external reference sample or the first sample of the sample set. The external modulus is sometimes referred to as a “fixed modulus” or just the “modulus.” In this case the reference is said to be modulated.

3.1.2 *external reference sample for magnitude estimation*—sample designated as the one to which all others are to be compared, or to which the first sample of a set is to be compared, when each subsequent sample in the set is compared to the preceding sample. This sample is normally the first sample to be presented.

3.1.3 *internal modulus*—number assigned by the assessor to describe the intensity of the external reference sample or the first sample of the sample set. The internal modulus is sometimes referred to as a “non-fixed modulus.” When an internal modulus is used, the reference is sometimes said to be unmodulated.

¹ This test method is under the jurisdiction of ASTM Committee E18 on Sensory Evaluation and is the direct responsibility of Subcommittee E18.03 on Sensory Theory and Statistics.

Current edition approved Aug. 1, 2012. Published August 2012. Originally approved in 1995. Last previous edition approved in 2005 as E1697 – 05. DOI: 10.1520/E1697-05R12E01.

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.

³ Available from ASTM Headquarters, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-29593.

⁴ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.