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Standard Guide for Sensory Evaluation of Products by Children and Minors¹

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1. Scope

1.1 This standard guide provides a framework for understanding the issues relating to conducting sensory and market research studies with children. It recommends and provides examples for developing ethical, safe, and valid testing methods. It focuses specifically on the concerns relevant to testing with children from birth through preadolescence. The guide assumes that minors older than 15 years of age are generally capable of performing sensory tests like adults, and therefore, all standard procedures used with adult subjects apply. The one exception, however, is legal consent where parental/legal guardian permission should be obtained for anyone under 18 years of age.

1.2 The guide will take into account the wide range of children's physical, emotional, and cognitive levels of development. It will prove useful for developing tasks that are understandable to children. It recommends alternative modes for children to communicate their opinions or perceptions back to the researcher, such as appropriate scales and measures.

1.3 The ethical standard presented in this document should be viewed as a minimum requirement for testing with minors. The safety and protection of children as respondents, as well as an attitude of respect for the value of their input should be of primary concern to the researcher.

1.4 The considerations raised in this document may also be useful when testing with the elderly or with adults who have developmental handicaps.

1.5 This document is not intended to be a complete description of reliable sensory testing techniques and methodologies. It focuses instead on special considerations for the specific application of sensory techniques when testing with children. It assumes knowledge of basic sensory and statistical analysis techniques.

2. Referenced Documents

2.1 *ASTM Standards*:²

E253 Terminology Relating to Sensory Evaluation of Materials and Products

E1958 Guide for Sensory Claim Substantiation

2.2 *ASTM Publications*³

ASTM Manual 26 Sensory Testing Methods: Second Edition Guidelines for the Selection and Training of Sensory Panel Members, ASTM STP 758, ASTM International, 1981

3. Summary of Guide—Specific Applications for Testing With Children

3.1 The primary use of children in sensory studies is to measure the acceptability of foods, beverages, pharmaceutical colors and flavors, and other products designed to be marketed to, consumed by, or used by children.

3.2 In this sense, they answer many of the same questions posed by affective sensory tests with adults. Children are used to measure overall acceptance, liking, or preference between samples. The resulting information can be used to aid in formulation changes or to choose between alternative products.

3.3 Sensory testing with children can also be used to identify unique characteristics or functions of products, such as the effectiveness of childproof safety caps. Other applications include advertising research or identification of unfilled needs or wants as part of the product development process (see Guide **E1958**).

3.4 Finally, some organizations are using children for basic research into the effectiveness of different scaling methods or sensory testing methodologies with children of varying ages.

4. Significance and Use

4.1 It is necessary and useful to test with children because they represent the real end-users for many products. Some products are developed specifically for children, and some are

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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.

³ Available from ASTM International Headquarters, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959.

dual-purpose products that are intended for adults and children. Examples include: baby foods, diapers, ready-to-eat cereal, juices, food or lunch kits, candy, toys, vitamins and other pharmaceuticals, music and videos, interactive learning tools, and packaging.

4.2 Children have influence over adults' purchase decisions and are responsible for many or some of their own purchase decisions.

4.3 Creating a product for children requires input from children because their wants and needs differ from those of adults. For example, they may differ from adults in preferences or sensory acuity, or both, for sweetness, saltiness, carbonation, and texture. It is impossible to predict the nature of these differences without actual input from the intended target audience.

5. Test Methods

5.1 Skill Development and Appropriate Testing:

5.1.1 Testing with children requires special consideration of their language development, motor skills, and social and psychological development. Every child is unique, and there is great variation within and across age groups. In developing appropriate test methodologies for children, it is more important to consider individual skill development than chronological age. **Table 1** provides a general guideline for expectations of skill level and appropriate evaluation techniques for each age group. For each age group, there is corresponding text discussing special testing considerations.

5.1.2 The researcher should keep in mind that there are many children in each age grouping who will fall below or above these skill levels. It is the responsibility of the researcher to verify the ability of the children to complete the task as planned or to modify it as required to meet the needs of the children selected for testing. For example, while some second grade children may be able to read and understand test instructions, others will need assistance with that task.

5.2 *Infants (Birth to 18 months) and Toddlers (18 months to 3 years):*

5.2.1 *Recommended Evaluation Techniques and Types of Information:*

5.2.1.1 Information may be gathered from behavioral observations, diaries, or records from an adult experimenter who may be a trained evaluator, or the child's primary caregiver. It is the adult who interprets infant or toddler responses. With toddlers, some verbal responses may also be obtained. When the primary caregiver is involved, having an unbiased observer watch the interaction between the child and adult is beneficial. Video taping the test allows greater flexibility and opportunity for additional review.

5.2.1.2 Information may include observations recorded before, during, or after product use in either a clinical environment or more natural usage situation (such as the home or a group child care environment). Behavioral observations may include hand and eye movement, facial expressions, time spent playing, amount and time of consumption, or interaction with the product. Diaries or records can be used to track intake or consumption, frequency and duration of use, length of attention

span, or the condition of the product before, during and after use. In addition, an adult can fill out a simple questionnaire with facial scales as a way to mimic the child's response and aid in interpretation.

5.2.2 *Cautions:*

5.2.2.1 Due to the limited language, attention span, and motor skills, the length of the testing session and number of products evaluated must be limited. Input from the parent/primary caregiver as to the amount and length of exposure is critical. Consideration may be given to exposing the caregiver to the products prior to the test as a way to screen and eliminate a large number of samples. This technique also allows the caregiver to increase their comfort level about exposing their child to the product.

5.2.2.2 Caution should be used when the caregiver is asked to make a subjective judgement for the young child. Primary caregivers, especially parents, may respond from personal preferences, interpreting for the child their own personal opinion. At other times, primary caregivers or parents may unknowingly establish a pattern of responses that they believe would present their child in a positive manner to the evaluator. An option to reduce potential biases includes providing an environment that fosters honest responses (for example, fielding through a third party agency or non-company identified facility, indicating the importance of the data, or how the data will be used, or both). Another option is to have the parent/primary caregiver feed the child first, record the child's response and then the parent/primary caregiver may be instructed to taste and record their own response.

5.2.2.3 Whether the observer is the primary caregiver, an experimenter or trained evaluator, adult interpretation of observational responses are subjective and may be affected by factors unrelated to the product in question. For example, physical discomfort on the part of the child, such as tiredness or illness, may result in behaviors such as refusing to eat or pushing products away with hands. An unbiased observer or videotaping the session, or both, in conjunction with parental/primary caregiver input can aid in cases where interpretation of a response is unclear. Multiple exposures and repeated evaluations may also be helpful.

5.3 *Pre-School (Age 3 to 5 years old):*

5.3.1 *Recommended Evaluation Techniques and Types of Information:*

5.3.1.1 Behavioral observations and the diaries used with infants and toddlers are also appropriate with children 3 to 5 years old. In addition, preschool children can begin using verbal skills to communicate their responses about the products. One-on-one interviews in the presence of a primary caregiver, paired comparisons, or limited use of sorting and matching techniques using pictures are appropriate.

5.3.1.2 Keeping in mind individual differences, many children in this age group can perform simple tasks that provide quantitative results. Suggested quantitative methods for preschool children include using facial scales to measure liking, paired preference, and preference ranking techniques.

5.3.2 *Cautions:*

5.3.2.1 Children 3 to 5 years old exhibit a wide range of developmental skills. This age group has relatively limited fine