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Standard Guide for Sensory Evaluation of Products by Children and Minors[1]

This standard is issued under the fixed designation E2299; 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.

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

TABLE 1 Summary of Skills and Behaviors of Children and Teens[A]

Skill/Behavior	Infant Birth to 18 months	Toddler 18 months to 3 years	Pre-School 3 to 5 years	Beginning Readers 5 to 8 years Kindergarten-2nd Grade	Pre-Teen 8 to 12 years 2nd Grade-6th Grade	Teenage 12 to 15 years 6th Grade-12th Grade
Language—Verbal, Reading/ Written Language, Vocabulary	Pre-Verbal. Rely on facial expressions. Cannot read. Cannot write. Use sounds, very few words.	Beginning to vocalize, adult interpretation still required. Cannot read. Cannot write. Early word usage developing.	Early language development. Can observe facial expressions, respond to questions and pictures. Generally reading and writing skills are not present.	Moderately developed verbal and vocabulary skills; cognitive skills increase. Early reading and writing skills vary greatly at this age. Adult assistance is advised.	Increasingly verbal—self-expression improves. Reading and written language skills increase rapidly and are sufficient for most self-administered tasks at the upper limits of this age group.	Generally strong language and vocabulary skills. Reading and written language skills continue to increase. Adult level in most respects.
Attention Span	Gauged by eye contact and bodily movement. Bright colors, sound, and movements capture attention.	Gauged by eye contact or involvement with task, bodily movement. Bright colors, sound, and movements capture attention.	Limited, but increasing. Bright colors, movement are effective.	Limited by understanding of task and interest level, challenge. Limit tasks to < 15 min.	Attention span is increasing, but holding interest is critical and sometimes difficult. Taking tests is a familiar activity.	Similar to adults, involvement and interest subject to peer pressure.
Reasoning	Limited to pain and pleasure.	Limited, but concept of "no" becoming a factor. Definite preferences begin to emerge.	Limited, but beginning to be able to verbalize what is liked and what is not.	Developing with increased learning, cause/effect concepts.	Full ability for understanding and reasoning, capable of decision making.	Reasoning skills are fully developed and similar to adults.
Decision Making	Do not make complex decisions.	Do not make complex decisions, but "yes"/"no" can be decisive. Ability to choose begins.	Limited, but concepts of what is liked and what is not strengthen. Able to choose one thing over another.	Ability to decide is increasing, but influence of adult approval is evident.	Capable of complex decisions, peer influences a factor.	Fully capable of adult decision processes, subject to peer influences.
Understanding Scales	Do not understand scales.	Do not understand scales.	Understanding of simple scales beginning, sorting or identification tasks more effective.	Scale understanding increasing, simple is best, use easy vocabulary.	Capable of understanding scaling concepts with adequate instruction.	Similar to adults.
Motor Skills	Possess some gross motor skills, no fine motor skills	Rapid gains in gross motor skills, fine motor skills still limited.	Development of gross and fine motor skills increasing.	Gross motor skills developed, fine skills becoming more refined.	Hand to eye and other fine motor skills developed.	Similar to adults.
Recommended Evaluation Techniques	Behavioral Observations Diaries Consumption or duration measurements		Previous, plus: Paired Comparison Sorting and Matching Limited Preference Ranking One-on-one interviews	Previous, plus: Simple attribute ratings Liking scales—pictorial (such as star scale) or simple word scales. Group discussions Concept testing	Previous, plus more abstract reasoning tasks. Hedonic scales. Simple attribute scaling and ratings.	Capable of all adult evaluation techniques.
Adult Involvement	Primary Caregiver Trained Observer Experimenter			Experimenter or Interviewer. Generally able to handle self-administered tasks.		Adult participation not required, unless appropriate to evaluation technique.

[A]These chronological ages are rough guidelines; a child's development age may not be the same as his/her chronological age. Researchers should pilot their test procedure with several respondents at the youngest age target to ensure that the child can do the required task and meaningful data can be collected.

motor skills, attention span, verbal and cognitive skills. These characteristics, combined with possible emotional dependence, require that testing protocols be kept simple and non-threatening.

5.3.2.2 Careful consideration must be given to testing location. Suggested options include testing in central location, educational, play or social settings. Familiar settings such as preschools, churches, synagogues, or home settings may be ideal. Both controlled and relaxed environments offer advantages and disadvantages that the researcher must consider. Generally, a relaxed atmosphere encourages more typical behavior when testing products with young children than a clinical setting, although a controlled setting may sometimes be necessary for test specific reasons.

5.3.2.3 Some children in this age group are uncomfortable with unfamiliar adults. A suggestion to ease their apprehension may be to include a warm-up period to introduce the child to the researcher and task in the presence of their parents/primary caregivers.

5.4 *Beginning Readers (Approximately 5 to 8 years old):*

5.4.1 *Recommended Evaluation Techniques and Types of Information:*

5.4.1.1 Children in this age group should be capable of completing any tasks that are used for testing with younger children. This age group usually has moderately developed verbal skills, an expanding vocabulary, increased cognitive abilities, and increased fine motor skills. Scale understanding is increasing, but limited word scales, facial scales, and paired preference are appropriate.

5.4.1.2 Although the early readers' ability to make decisions are increasing, choices should be limited and testing tasks should be simplistic. Appropriate techniques include using one-on-one interviews, short affective tests, or brief group discussions to accommodate the limited attention spans inherent to this age group.

5.4.1.3 Some children in this group are better able to convey more details about their likes and dislikes, preference ratings, product liking, and acceptance decisions than their younger counterparts, but not all have that capability. At this stage, since everything they do is so dependent on skill level, very simple tasks yield the best opportunities for success. Additional life experience and exposure to product advertising can lead to a better understanding of impressions about products and the development of more personal preferences. Children in this age group can certainly identify what they like, but not necessarily why they like it. Many do not understand the difference between sweet and sour, thick and thin, etc. Some children in this group, however, are able to understand and use just-about-right (JAR) scales, but only with very simple vocabulary.

5.4.2 *Cautions:*

5.4.2.1 Scale understanding and use is still limited for this group. Facial scales or one-on-one interviews are likely to be more effective than word-only scales that may not be completely understood. Simple, basic vocabulary is key. At best, children in this group can indicate if they like "how something looks," but not if they like its "appearance." They can indicate if they like the "taste" of a product, but not its "flavor." They can respond to "how it feels in your mouth," but not to "texture." Simple vocabulary is necessary. Adult intervention may be required for clarification of test instructions or assistance with reading tasks, but the researcher must be aware of potential parental influence or a desire on the part of the child to please the adult interviewer.

5.4.2.2 At this age, most children can participate in short interviews without the presence of their parents/primary caregivers. For some children, emotional maturity and shyness may interfere with their ability to adequately complete the task and may result in a complete lack of response. The researcher is faced with a decision on how to handle children who have difficulties, and must determine whether or not their data should be eliminated, or if the child should be replaced through additional recruiting.

5.4.2.3 As mentioned with the previous age groups, simplicity is key. The researcher who keeps the task simple and gives clear, concise verbal directions will improve the likelihood of a successful test.

5.5 *Pre-Teen (8 to 12 years old):*

5.5.1 *Recommended Evaluation Techniques and Types of Information:*

5.5.1.1 Children in this age group should be capable of completing any tasks that are used for testing with younger children. Many children in this age group are also able to complete more challenging tasks and understand increasingly complex wording, which allows for greater flexibility in questionnaire design. Self-administered tests are usually appropriate for this age group. However, diversity in skill level can be especially pronounced in this age category. The researcher must continuously be aware of differences in skill levels, and be prepared for some children in this group to overlap with the early reader skill level. Sometimes, even basic reading skills are not fully developed until 11 to 12 years of age, and therefore, some children may require adult assistance in order to read the questionnaire or to complete self-administered questionnaires.

5.5.1.2 Quantitative techniques that are effective for this group are paired comparison or paired preference choices, ranking tasks, basic attribute and JAR scales (for example, sweet), and hedonic scaling (facial expressions may be more suitable than word anchors for the younger portion of the age group) (see Terminology E253 for definitions of terms). One-on-one interviews are still appropriate for this age group. At this age, children can be expected to participate in short interviews without the presence of their parents/primary caregivers. Responses to open-ended questions may be quite limited, and some younger children in this group may have difficulty with answering any open-ended questions, except in an interview format.

5.5.1.3 Qualitative techniques such as focus group discussions are useful with this age group to address qualitative objectives, including concept testing. Depending on the testing situation, consider testing older children in this age group separately by gender.

5.5.1.4 In general, this age group is increasingly able to handle abstract ideas and complex decisions. Children in this age group have definitive ideas about their likes and dislikes, which may be quite different from adults. As verbal skills

increase, they can provide increasingly informative descriptions about their impressions of products.

5.5.2 *Cautions:*

5.5.2.1 At this stage in development, interactions between boys and girls have increasing potential to interfere with concentration and attention to the task at hand. To aid in obtaining clearly individual responses and to avoid the bias that comes with peer interaction, it may be necessary to separate children who are friends. This usually applies when testing in a group setting such as school or camp. This is similar to the concerns previously expressed regarding parent/primary caregiver-child interactions, or problems encountered when testing with adults who are acquainted. The desire and pressure to agree with one's peer group can be a powerful influence that may bias sensory test results, and good sensory practice dictates that the sensory professional anticipate potential sources of bias and protect against them as much as possible in structuring the test.

5.6 *Teen (12 to 15 years):*

5.6.1 *Recommended Evaluation Techniques:*

5.6.1.1 Teens are capable of completing all types of tests described for preteens. In addition, they are able to complete more complex questionnaires requiring multiple decisions. Their abilities are similar to those of adults, and they are able to participate in discrimination testing if they are trained to perform the task.

5.6.1.2 Evaluators between 12 and 15 years of age are increasingly verbal and can provide detailed descriptions of their likes and dislikes of products, as well as the reasons for those attitudes. JAR scales should pose no difficulty as long as the attributes in question are understood. Teens are able to use attribute scales and provide intensity ratings for product attributes.

5.6.2 *Cautions*—Consider the cautions described in 5.5.2.1. Again, it is important to emphasize that during group discussions, the researcher should consider separating males and females in order to limit distractions. Peer influence is important to teens and should be considered to assure unbiased responses.

6. Procedures—Test Design and Protocol

6.1 *Test Types:*

6.1.1 The standard formats used when testing with adults are also used with children, for example, home use, or central location tests, with modifications for the special circumstances that arise with children as subjects. Pretesting is recommended to determine the appropriate ratio of adults or administrators to children necessary for effective execution of the test. In addition, pretesting is necessary to determine the appropriateness of the questionnaire and the test method being used.

6.1.2 Computers are used effectively with children, depending on their experience and exposure. When using computers, the basics regarding skill-appropriate questionnaire design should be applied, using pictures and scales appropriate to children. When conducting tests outside the home, facilities should be structured to be user-friendly and safe for children.

6.2 *Criteria for Using Children as Subjects—Recruitment and Screeners:*

6.2.1 Parental/legal guardian consent is strongly recommended, and may be required by law. Consult your legal professional for additional guidance regarding parental/legal guardian consent (Fig. 1). In addition, having the participating child assent to testing, while non-binding, may help to impress the child with the importance of his/her participation.

6.2.2 Children can be recruited from a wide variety of sources, with advantages and disadvantages to each (see case studies for examples of various recruitment scenarios). Over-recruiting is helpful with children as well as adults. Additionally, the behavior of the potential participants may be observed in the waiting room to eliminate those who may be too shy, nonverbal, or disruptive.

6.2.3 The number of children for the study will vary based on the objective, the test design, and the scope of information desired, in the same way as testing with adults. When testing with children, recruiting a somewhat larger assessor base is recommended because of the potential for unusable data, or dismissal of children prior to the study due to variation in children's ability to respond because of basic skill level.

6.2.4 Many youth groups, sports groups, community-based groups, etc. may be a source of children for testing. Whenever possible, it is recommended that children from more than one group be recruited. This will help the researcher avoid potential biases due to homogeneity of children in terms of ethnic origin, religion, parent's social background, etc.

6.2.5 Standard techniques such as shopping mall recruiting, newspaper advertising, and organizational recruiting are also used.

6.2.6 Regardless of the source of recruiting, screening is necessary to obtain the proper sample of children to meet the test objective. Screeners should be administered first to the parent/primary caregiver, and then to the child participating, depending on their age. While skill level is an important factor in all aspects of sensory testing with children, skill level is not the most important factor during screening. The test design can be adapted to be appropriate for the ability of your desired target audience. Current usage of the product within the category is often a criterion for selection of participants, as well as the age and gender of the audience for whom the product is intended. In the case of new products, a willingness to try the product or an interest in the concept may be the most appropriate criterion.

6.2.7 When determining secondary screening qualifications, developmental factors such as comprehension and verbal communication skills must be considered. With young children, visual response techniques are sometimes employed for screening. Verbal screening is suggested for children up to age 7 or 8, because it has been observed that younger children may have difficulty completing a written questionnaire without assistance. The researcher may find it necessary to recruit a category user group as an initial step, and follow up with additional screening to accommodate those children who have not yet developed the skill set necessary to complete the task required.

6.2.8 Consideration of allergies is especially important with children, making informed parental/legal guardian consent a necessity for participation. In most cases, it is prudent to

Parental/Legal Guardian Consent Form and Confidentiality Agreement
CHILDREN'S TESTING ASTM

Dear Respondent:

Thank you for allowing your child's participation in our product research project. We are conducting this study to provide manufacturers with consumer input about the product(s).

During the course of this study, your child may discuss ideas and see products that may not be available to the general public. Accordingly, by signing this document, you agree to keep subject matter of this study **strictly confidential.** All discussions including creative ideas and suggestions resulting from this study shall be the property of the sponsoring company.

You agree not to disclose any information relating to this study to any third party, and not to use this information and knowledge for any purpose other than for the performance of this study. You must agree not to sketch, photograph or make images of the products your child is testing.

Your child's safety is most important to us. If your child has any kind of food allergy or any kind of food sensitivity, we require that your child not participate in this test. Additionally, if your child is suffering from a cold or allergy, has any condition that would prevent your child from smelling or tasting the products, again we require that your child not participate in this test. Please check one of the boxes below.

☐ My child does NOT have any known allergies or sensitivities to any food or food ingredients.

☐ My child does HAVE a food allergy, sensitivity, or other dietary restrictions.

Your child has the right to stop participation at any time during the test.

By signing below, I acknowledge that I have read and understand the information presented above and that my child will maintain the products and all product information in confidence.

PRINT NAME OF CHILD: _____
PRINT NAME OF PARENT/LEGAL GUARDIAN: _____
SIGNATURE OF PARENT/LEGAL GUARDIAN: _____
RELATIONSHIP TO CHILD: _____
DATE: _____
WITNESS: _____
DATE: _____

FIG. 1 Example of Informed Consent Form Used for Testing with Children

eliminate children that have any allergies to food, skin or fragrance ingredients. However, there may be cases where a child with an allergy may be important to the product being tested. An example is a soy butter that is used as a substitute for peanut butter, where children with peanut allergies are recruited so they can evaluate this product. In this case, a list of ingredients contained in the test products must be provided for informed parental/legal guardian consent. It may be necessary to note that products are manufactured in a facility that also processes other potential allergens. Consult your legal professional for additional guidance and risk assessment regarding evaluation of food or personal care products by children with allergies.

6.2.9 Creating a safe testing environment must be a primary consideration, even if it requires planning for physical limitations at a given developmental stage, such as testing very sticky or chewy products with young children that may have loose teeth, or for teens with braces. Please consult your legal department and refer to Section 8, Legal and Safety Issues, for additional screening considerations.

6.3 *Number of Subjects*—In a Central Location Test, when the number of children required is large, testing with smaller subgroups can make the task easier to manage. The number of administrators present should be proportional to the complexity of the task and taking into consideration the age of children in the study.

6.4 *Description of the Task:*

6.4.1 Children can participate in sensory tests concerning taste, visual appeal, or texture of food, for personal care products and toys, or pharmaceutical products. Visual tests of a product's eye appeal are also effective with children. Visual tests are often used with packaging, advertising issues, or with items such as toys. Home-use tests or one-on-one studies are useful for testing non food items such as disposable diapers. In-home testing may also be appropriate when the child is intended to be involved with the actual use of the product over time, such as making their own peanut butter and jelly sandwiches, or using ready-to-eat cereals on multiple occasions.

6.4.2 Depending on their skill level, children are capable of performing a variety of tasks. They can tell the researcher if a product is liked or disliked, and in some cases to what degree it is liked or disliked. They can rank products in order of their preference, and some are capable of answering simple and well-defined attribute questions. Use of a trained interviewer is essential with young children, and with older children, a trained interviewer allows a means of assessing how well the child understands the questions being asked. In a self-administered test, the child should be able to comprehend the questions being asked. Certain inherent biases exist when products are tested at home. Therefore, care should be exercised when determining the appropriateness for home-use tests that can be influenced by parents/primary caregivers.

6.5 *Time to Complete Task:*

6.5.1 The key to successful testing with children is to keep the task short and to the point and to do the same with the length of the test session. Expectations should be set at the onset of the study. The time required for task completion is largely dependent on the test design, objective, and execution plan. Taste tests should be kept short due to fatigue, but other tasks can be longer if evaluative tools are entertaining. It is essential to have the task completed before the child loses interest, and attention wanders. If there are breaks between samples, provide activity books with word games for children to help occupy their time.

6.6 *Questionnaires:*

6.6.1 Depending on the age and developmental level of the children being tested, hedonic scales, star scales, intensity scales, and just about right scales have been used successfully. Multiple point children's language hedonic scales (that is, super good—super bad) may be used with ages 6 to 12, as can traditional multiple point hedonic scale, provided all the children can read or, more importantly, can understand the meaning of words, or both.[4,5] Prior to testing, an appropriate orientation is important to ensure that children have an understanding of the scale and the rating task. Facial scales, which use cartoon-like faces to express like and dislike and were developed for those with limited reading nor comprehension skills. They have been in use for a long time when testing with children. However, new cultural issues have been brought to light that may make this scale less optimal and facial scales have not been shown to provide advantages over verbal scales when used in consumer research. On the contrary, facial scales introduce their own complications. For example, children may respond by selecting a "happy" face because they like that face rather than because it represents their opinion about the product they are evaluating. For children, the cognitive task of matching an emotion expressed by a face to their reaction to a product may require more abstract thinking than a response on a verbal scale. Another potential distraction for children is that the faces may not reflect the child's racial or ethnic identity[6] and that the meaning of facial expressions is far from universal across culture. For these reasons, facial scales are not recommended until more positive evidence is available that supports their use.

6.6.1.1 For children ages 3 to 5, choice questions are best. To obtain liking, you can first ask the child if they feel the product is good or bad. Depending on their response, they are then asked if the sample is "really good" (really bad) or "just a little good" (just a little bad). If in the first choice the child is not able to specify good or bad, their response is coded as neither, and the subsequent questions are not asked.

6.6.1.2 *Use of Intensity and JAR Scales*—Children ages 8 and higher are capable of using intensity scales. Since children in consumer studies often receive only a brief orientation to their rating task, it is important that the attribute whose intensity they are scaling be easy to understand; such comprehension, if in doubt, should be verified by pre-testing the questionnaire. Children can easily perform ratings of appearance, including size or visual amount. Other attributes, such as sweetness or hardness (of food products), are also easy for children to understand. In the case of more complex flavor or texture characteristics, the assumption that children understand the meaning of the attribute is likely not warranted.

6.6.1.3 Just-about-right scales used with children usually take the form of a three-point scale (not enough, just right, too much). JAR scales can give meaningful results with children, although as in the case of intensity scales, careful consideration must be given to the choice of attribute. Appearance attributes, basic tastes such as sweetness or sourness, and simple food texture attributes may be appropriate for this age.

6.6.2 Table 2 and Fig. 2 give an example of scales. Scale terminology needs to be validated for appropriateness to the children being tested. The questionnaire should be pretested to be sure the questions are understandable, the instructions can be followed, and the tasks can be completed independently. Pretesting also gives a sense of the average length of time needed for children to complete the testing tasks. It is recommended that a warm-up exercise be used to familiarize the children with the scale(s) and give them confidence before proceeding with the actual product evaluation.

6.6.3 When using self-administered questionnaires rather than one-on-one interviewing techniques, the questionnaire should be uncluttered, simple, and easy to read. Large type fonts and plenty of white space, as well as brief, clear instructions may help clarify the task of answering questions without adult assistance. Because of possible limitations with regard to their experience level, precautions should be used in terms of selection of attributes to be measured. Simplicity is the rule.

6.7 *Incentives*—The incentives offered vary as much as the sources of children for sensory testing. Gift certificates for both the children and their parents/primary caregivers, money for the organization or school, and cash are often used. Other ideas

[4] Popper, R. and Kroll, J. J., "Issues and Viewpoints: Conducting Sensory Research with Children," *Journal of Sensory Studies*, 20, 2005, pp. 75-87.

[5] Spaeth, E. E., Chambers, E. IV, and Schwenke, J. R., "A Comparison of Acceptability Methods for Use with Children," *Product Development and Research Guidance Testing with Special Consumer Groups, Second Volume, ASTM STP 1155*, Louise S. Wu and Ayn D. Gelinas, Eds., ASTM International, 1992.

[6] Cooper, H.R., Holway, A., and Arsan, M. "Cross Cultural Research—Should Stimuli be Psychologically Pure or Culturally Relevant?" *Marketing Research Today* Vol. 26 (1), pp. 67–72. 1998.

TABLE 2 Examples of Scales for Testing with Children

Super good	Really good	Good	Just a little good	Maybe good or maybe bad	Just a little bad	Bad	Really bad	Super bad
Like extremely	Like very much	Like moderately	Like slightly	Neither like nor dislike	Dislike slightly	Dislike moderately	Dislike very much	Dislike extremely
		Like a lot	Like a little	Neither like nor dislike	Dislike a little	Dislike a lot		
	Super good	Really good	Good	Maybe good or maybe bad	Bad	Really bad	Super bad	
		Needs to be way stronger	Needs to be a little stronger	Just right	A little too much	Way too much		
			Not enough	Just about right	Too much			

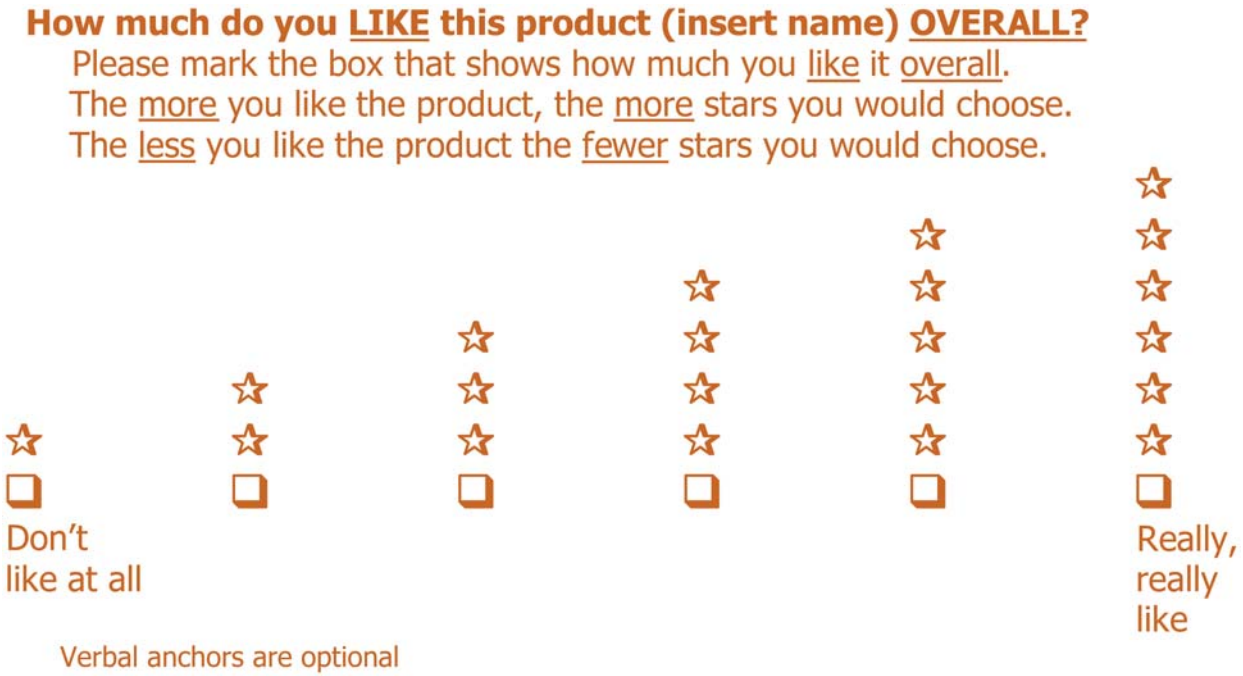

FIG. 2 Example of Non-Verbal Scale used for Testing with Children

include tickets to movies, sporting events, or coupons. Value and nature of incentives should be based on the amount of time required of the child/primary caregiver, effort to recruit kids, and age of child. Incentives should be explained to parents/legal guardians prior to testing.

6.8 *Location*—The actual location of the test depends on the study design or objective. If central location testing is appropriate, the test site must be selected to meet the requirements of the study, and to match the testing objective to the respondent's needs. For example, tables may be lowered to suit the respondents. Tables should be set up so children are not facing each other during the testing. Age appropriate pictures may enhance a sterile environment as long as they are not too distracting. Picnic style or beanbag chairs lend themselves to certain test situations. Schools, churches, research facilities, and state fairs have been used with success. Safety issues must always be considered, especially with young children. Adequate supervision is necessary at all times and will be more labor intensive than with adult testing. The researcher should anticipate interaction between children and plan appropriate intervention in order to minimize potential bias.

6.9 *Adult Involvement*—The age of the children being tested and the test objective are important considerations when deciding on the extent of adult involvement. Direct involvement of the primary caregiver is suggested for children under the age of five (5). Often, parents/primary caregivers are in attendance but are given their own separate tasks in order to minimize their influence on their child's responses. In some cases, parental/primary caregiver involvement is necessary and appropriate. In home-use situations, parents/primary caregivers are typically involved in administering the test and collecting the data. If a child age five (5) or older is unable to separate from the primary caregiver, then the test can proceed with the primary caregiver in the room. If requested, it is acceptable to let the primary caregiver view unobtrusively the activities of the child.

6.10 *Permission:*

6.10.1 Regardless of the extent or nature of the task, parental/legal guardian consent is required. It is prudent to protect the child, yourself, and those you represent as a researcher.

TABLE 3 Informed Consent Form

This consent form is being presented to you, because after a discussion about this research study and being verbally informed, you are allowing your child to participate in this research study. Participation in this study is completely voluntary and done at your own risk, and if you or your child refuses to participate or decide to withdraw from this study at any time, you may do so without penalty or loss of any benefits to which you are otherwise entitled. If your child has any food allergies or food sensitivities, we require that your child not participate in the study. By signing below, you are confirming that your child does not have a food allergy, sensitivity or other dietary restriction. (For example: peanuts, almonds, walnuts, pecans, milk and/or dairy products, eggs, soy, fish, shellfish, grains, sulfating agents, etc.) A listing of all ingredients contained in the products your child will taste is available upon request. The information gathered from this study will be combined and individual results will not be released. In addition, you agree to keep the products and associated information from this study completely confidential and you agree that all ideas, discoveries, concepts and other information developed or derived from you or your child due to their participation in this research study.

By signing below, you confirm that you have read and understood the statements above and agree for your child's participation in this research study.

_____
Printed Name of Child

_____
Printed Name of Parent/Guardian Relationship to Child

_____
Signature of Parent/Guardian Date

6.10.2 If products are ingested or topically applied, parents/legal guardians must be informed of the ingredients which "may or may not" be present in the samples. Parental/legal guardian permission slips must include: (*1*) permission to test, (*2*) consent for dispensation of compensation to the school or organization if appropriate, and (*3*) verification of no food or drug allergies on the part of the child. It is recommended that the internal corporate legal department be consulted for approval of all permission slips. An example is shown by Fig. 1.

6.10.3 For pharmaceutical testing, two witnessed copies of an informed consent document are required, one for the parent and one for the testing facility to keep on file. In some situations, approval by an independent review board is required. More detail on the legal issues involved in testing with children is given in Section 8.

6.11 *Data Analysis*—Statistical techniques that are appropriate for the specific test design and protocol should be utilized. Statistical techniques for evaluating data from testing with children should follow previously established ASTM methods where appropriate (see ASTM Manual 26[7]). It is good sensory practice to study the distribution of scores. With young children, there may be a tendency for over-representation of the extreme ends of the scale (and possibly the midpoint). This illustrates why careful selection of a scale appropriate to the child's understanding level is so critical. It is also recommended that the child's ability to use the scale be tested through a practice session or some internal validity check (see 6.6.2). As long as the children tested have sufficient familiarity with the scale used, the end result will be data that are more reliable. (See Table 2 for examples of scales.)

[7] Chambers, E. and Wolf, M. B., *Sensory Testing Methods: Second Edition, ASTM MNL 26*, ASTM International, West Conshohocken, PA, 1996.

7. Interference—Adult/Child Interaction

7.1 *Test Administrator (This may include interviewer, moderator or monitor):*

7.1.1 *Issues:*

7.1.1.1 Special attention should be given when selecting administrator(s) for conducting sensory studies with children. Among the considerations should be the personal style of the administrative staff. The staff should be child-oriented, experienced with children and their level of conversation. Previous experience with the age group involved increases the staff's comfort level when working with children. The staff must also be able to maintain control to ensure the testing environment is conducive to testing. The number of adults required for test administration increases as the complexity of the task the child is asked to complete increases. The administrator should provide a degree of emotional support and make the experience as pleasant as possible for the child.

7.1.1.2 Training or experience with the appropriate age group will allow test administrators to speak in familiar terms with the children, including slang expressions. They should be able to quickly rephrase any questions that are not clear. Administrators should be educated in the nonverbal body language and facial cues of children, and they should also be aware of their unconscious feedback to the participants and its influence on testing results.

7.1.1.3 When the test design calls for one-on-one interviews with young children, consideration should be given to the physical attributes of the interviewers in an attempt to avoid those who may intimidate the children. It is suggested that interviewers should be dressed in comfortable clothing that is not overly authoritative (that is, lab coats). Perfumes or colognes should not be worn. Depending on the test and the task involved, interviewers must also be able to physically move around or sit on the floor at the child's level if necessary.

7.2 *Parents/Legal Guardians/Primary Caregivers:*

7.2.1 *Issues and Strategies:*

7.2.1.1 Presence of a primary caregiver should be considered prior to the test, including the physical location of the primary caregiver during testing and the level of primary caregiver participation, if any. Primary caregivers will need to provide transportation for the child, and usually prefer to remain until the testing is complete. Depending on the age and comfort level of the child, a decision should be made as to the location of the primary caregiver during testing. Unless the test requires primary caregiver/child interaction, the presence of the primary caregiver should be discouraged during testing. Children with extreme separation anxiety are best disqualified. In general, holding the test in a school, church, or recreational facility that is familiar to the child can help eliminate testing anxiety.

7.2.1.2 If primary caregivers are present during the test, consideration may be given to having the primary caregiver complete a separate task to avoid influencing his or her child. Examples including filling out a questionnaire, reading a magazine, or engaging in some other type of quiet, non-distracting activity. The level of the primary caregiver's participation will vary greatly based on the type of test and the age of the child.

7.2.1.3 For home-use test situations, the primary caregiver involvement will be considerably greater than a central location test environment. Developing an instruction sheet for the primary caregivers that describes their role in the test (assisting with the questionnaire, recording responses, or serving samples) will avoid confusion.

7.3 *Teachers:*

7.3.1 *Issues and Strategies*—When testing in a school or club environment, the presence of teachers or leaders may affect test outcome, either positively or negatively, in the same way that primary caregivers can. The role of the teacher or leader in the testing process should be clearly defined prior to the test. Items to consider include level of participation, responsibility, location, and time of day within the lesson plan or club meeting. Give the teacher/leader a detailed list of test timing, presentation, and expectations. Additionally, work with the teacher to decide where the test will be positioned within the lesson plan for the day. An appropriate responsibility for teachers or leaders is to verify that permission or consent forms were received from the individuals participating. Establish the test administrator as the authority figure for the time required to complete the test. Prior to the test, discuss the other adult's exact role.

8. Legal and Safety Issues

8.1 *Legal*—Preparing a guardian or parental consent form is a first necessary step when carrying out any type of testing with children. These forms should be reviewed and approved by an internal or external legal advisor to the corporation and are to be signed before the child participates in testing. When pharmaceuticals or unapproved (experimental) ingredients are to be included in the test, two copies are to be signed by the parent in the presence of a witness before the child is admitted. It is also advisable to utilize an Institutional Review Board (IRB) for protocol and documentation when pharmaceutical or special ingredients are used in tests. Additional information on IRB and Informed Consent can be obtained in Section 45 Code of Federal Regulations (Title 45). Check the local regulations and product specifications to verify that the products being tested conform to all regulatory and local laws.

8.2 *Safety:*

8.2.1 It is the responsibility of the testing group to make sure that no harm or injuries occur as a result of faulty products or test facilities. All children participating in testing are to be screened for allergies to ingredients (for example, peanuts, milk, soy, fish and shellfish, eggs, wheat, tree nuts, chocolate, sweeteners, food colorings, MSG, etc.), and a list of all ingredients must be made available for parents/legal guardians to review and approve prior to testing. Make sure that all serving temperatures are suitable for children and that serving sizes are appropriate for the age group. Take special care with piece size to avoid choking situations. The researcher must think both as a parent and as a researcher to determine what might constitute a risk factor when testing with children. In general, respect for the safety and well being of your young subjects is always appropriate.

8.2.2 Other personal safety issues should be explored and accounted for in executing the test. Is the building child proof? If children are being brought to the test site, rather than testing in school or as part of a familiar organization, there should be a means for signing the children in and out. Only the parents/legal guardians or other pre-authorized adults can be allowed to pick up the child at the conclusion of testing.

9. Keywords

9.1 behaviors; children; consumer products; infants; legal; market research; parents/legal guardians; preschoolers; preteens; questionnaires; recruitment; safety; screeners; sensory testing; skills; teens; toddlers

APPENDIXES

(Nonmandatory Information)

X1. CASE STUDY 1

X1.1 Background

X1.1.1 Company XYZ, a confectionery company, wished to market a candy product positioned towards children. A selection of four alternatives which differed in visual attributes was proposed. A visual evaluation of the four alternatives was required to find out which alternative was preferred prior to market introduction.

X1.2 Objective

X1.2.1 To determine the preference of visual presentation of a candy product being marketed towards children 5 to 9 years of age.

X1.3 Sample Population

X1.3.1 A sample population of $n = 95$ children was used for this study, with a gender split of 48 boys and 47 girls. The children were aged 5 to 9 years and were students in a parochial school. The sample groups were split into three groups by grade and age (5 to 6 years, 7 to 8 years, and 9 years old). The children were screened for liking of the general category represented by the four product preparations.

X1.4 Test Protocol

X1.4.1 The test was conducted in the gymnasium of the parochial school where the children were students. Even

though the evaluation was visual only, and no product was ingested, parental/legal guardian consent was obtained to be sure parents/legal guardians knew of their child's participation in the activity. Each of the three groups of children was tested at a separate time.

X1.4.2 The test products were four visually different candies (shape and color). The children were presented with all four products simultaneously, with the order of product occurrence balanced in order from left to right for each child. Interviewers verbally asked each child which product they liked best, second best, and so forth. Since many of the children did not have adequate reading or comprehension skills to handle the task on a self-administered basis, adult helpers worked with the children one-on-one and recorded their responses. Each child took 1 to 2 min to complete the task.

X1.5 Results

X1.5.1 Analysis of the ranked scores showed significant differences among the four products for visual preference. All three age groups ranked the four products in a similar order. However, there seemed to be less differentiation among ranking for the 7 to 8 year-olds than for the 5- to 6-, and 9-year-old groups.

X2. CASE STUDY 2

X2.1 Background

X2.1.1 Company A wished to market an over the counter cough syrup to children aged 5 to 12 years. Research and Development developed two prototype syrups, which it wished to evaluate against the leading competitive product. From this evaluation, staff at Company A will decide which of the two prototypes to launch, provided it matches or exceeds the competitor for overall liking. Other attributes will also be measured to assist development staff with any formula refinement the prototypes may require.

X2.2 Objective

X2.2.1 *Project Objective*—To launch an acceptable cough syrup on the market, one which matches or exceeds the leading competitor in acceptability.

X2.2.2 *Sensory Objective*—To determine the overall liking of the product and to obtain diagnostic information about characteristics such as color, smell, flavor, and aftertaste.

X2.3 Sample Population

X2.3.1 A sample population of n = 100 children was used for this study, with an even split by gender. The children were aged 5 to 12 years and were split into two age groups: a 5 to 8 years group, and a 9 to 12 years group (with an equal number in each age group). In addition to screening the children for their age and gender, they were screened for previous usage of the category, absolutely no allergies to medications, food additives or coloring, and no current medication use. The children were recruited by telephone and the telephone interview included a full explanation to the parent of what the test involved and when to bring the child to the central location.

X2.3.2 The test protocol and all of the test documents including the informed consent forms, product ingredient listings, and dispensing directions were reviewed by an independent review board (IRB) prior to the recruitment.

X2.4 Test Protocol

X2.4.1 The children came to a central location facility with private interview stations, waiting areas, and qualified interviewers to work with the children one-on-one. Before each child was admitted to the test, two copies of the informed consent form were signed by the parent/legal guardian in the presence of a witness. The parent/legal guardian was given one copy of the form to retain. All tests were conducted by an interviewer and parents/legal guardians were invited to be present during the interview. Most parents/legal guardians preferred to leave their child with the interviewer, but if they remained, they were seated out of direct eye contact with the child and asked not to interact with him or her.

X2.4.2 The product samples were presented in a sequential-monadic and randomized order. Each syrup sample was dispensed in a measured amount (5 mL or less depending on the daily dosage of the product) onto a spoon in front of the child. Each child was asked to rate each syrup for overall liking. The youngest children (5 to 8 years) used a star seven point hedonic scale for all of their ratings. The older children used seven point hedonic and intensity scales to rate the syrups.

X2.4.3 The evaluation of each syrup took approximately 5 min. Each child was given water and a cracker between syrup samples and asked to wait 10 min before the next syrup was evaluated. The combined dosage of all three syrup samples was less than one daily dosage for the youngest child in the study (a requirement for approval of the test protocol by the IRB).

X2.4.4 A monetary incentive was given to both parents/legal guardians and child for completing the evaluations.

X2.5 Results

X2.5.1 The mean scores for the three cough syrups were as follows (where, 7 = like a whole lot, and 1 = dislike a whole lot):

	n = 50 5 to 8 years	n = 50 9 to 12 years
Competitor X	6.4a[A]	5.4a
Prototype A	5.8a	4.2b
Prototype B	4.6b	3.1c

[A] Means sharing a common letter do not differ significantly ($p \leq 0.05$).

X2.5.2 The results indicated that the younger children were less discriminating than the older children. They found Prototype A to be equal in acceptability to Competitor X. The older children rated all three cough syrups differently in terms of acceptability. To these older children, competitor X was

significantly more acceptable than either of the prototypes. Prototype B was significantly less acceptable than Competitor X to all the children.

X2.6 Recommendations

X2.6.1 Prototype A has the most potential with the target population (children aged 5 to 12 years). Although Prototype A meets the action standards amongst children aged 5 to 8 years, the results indicate that these children are less discriminating than the older children (aged 9 to 12 years). Further refinement of Prototype A (using the diagnostic information from the attribute ratings) is recommended as a follow-up prior to commercial launch of the cough syrup.

X3. CASE STUDY 3

X3.1 Objective

X3.1.1 To determine which of two citrus-flavored bubble gums to introduce for target group consumers between the ages of 6 to 12, inclusive.

X3.2 Sample Population

X3.2.1 One hundred employee's children between the ages of 6 and 12, inclusive, who chewed five or more pieces of bubble gum per week, and who were willing to try the product and flavor being investigated, were recruited via the company's electronic mail system. The electronic mail communicated the expected length of the visit—20 min. Quotas were set to achieve a 50/50 gender split nested within the sub-groupings of 6 to 8 years (n = 50) and 9 to 12 years (n = 50).

X3.3 Test Design and Protocol

X3.3.1 A central location study was conducted in the company cafeteria using a sequential-monadic design. Each respondent evaluated both samples in a random order. Appointments were scheduled for after school and Saturday mornings. Ten children were scheduled for each half an hour time period.

X3.3.2 Upon arrival, children were rescreened in the presence of the parents/legal guardians to ensure that they met the screening requirements. Parents/legal guardians waited in a reception area during the evaluations.

X3.3.3 Each child was seated at a table. The tables and chairs were arranged so that no respondents faced other respondents during the evaluation. Each child participated in a warm up exercise using the seven point hedonic scale to achieve familiarity with the use of the scale. He or she was asked: what is your favorite food? A seven on the scale represented his or her favorite food, and a one on the scale represented his or her least favorite food. Once the administrator was comfortable with the child's understanding of the concept, the child began the evaluation phase of the study.

X3.3.4 The child was asked to eat an unsalted cracker and to drink some bottled water. Next, the child was asked to chew the assigned gum for 3 min. (The test administrator instructed the respondent when to begin chewing and when to stop chewing.) After the 3 min time period had elapsed, the child was told to remove the gum from his/her mouth. Then, the respondent completed an interviewer-administered questionnaire (see Note X3.1). Next, the child was asked to eat another cracker and drink some more water. After 3 min had passed, the child was presented with the second sample and repeated the same evaluation process.

NOTE X3.1—For children 6 to 8 years of age only smiley face scales were used. For children 10 to 12 years of age, smiley face scales with the addition of verbal descriptors were used. Overall, color and flavor liking were asked. These modifications to the scales were made based on prior experience which indicated that while the smiley face scale is appropriate for 6 to 8 year olds/early readers, older children perceive the smiley face scale without descriptors to be too immature for them.

X3.4 Incentives

X3.4.1 Each parent received a $5.00 gift certificate to the employee store. Each child received a certificate for a meal at a local pizza/fast food restaurant. They also received a pack of bubble gum upon leaving the testing facility.

X3.5 Results

6 to 8 years	Prototype X	Prototype Y
Overall Liking	5.4a	4.9b
Color Liking	5.5a	5.4a
Flavor Liking	5.3a	4.7b
9 to 12 years	Prototype X	Prototype Y
Overall Liking	5.2a	4.4b
Color Liking	4.7a	4.7a
Flavor Liking	5.2a	4.3b

NOTE X3.2—Means sharing a common letter do not differ significantly ($p \leq 0.05$).

X3.5.1 Prototype X was significantly more acceptable to both subgroups than Prototype Y. Although the older subgroup tended to give the prototypes lower ratings than the younger subgroup, there was no significant interaction by age subgrouping.

X3.6 Recommendation

X3.6.1 Based on these results the introduction of Prototype X was recommended.

X4. CASE STUDY 4

X4.1 Project Objective

X4.1.1 A cereal manufacturer wished to market a new puffed corn cereal targeted for children.

X4.2 Test Objective

X4.2.1 The type of flavor that would be used on the puffed corn cereal would be determined through the liking scores obtained from an in-home use test. There were six flavor variations to be tested with children.

X4.3 Methodology

X4.3.1 Employees from the cereal manufacturer were asked to participate in this home study. Those employees with children ages 8 to 12 were recruited. The samples were sent home with the employees with a release form, instructions (see Tables X4.2 and X4.3), and a questionnaire. The cereals were to be consumed using the type of milk that they normally use at home. Each child evaluated two out of six samples. One cereal was consumed each day for two consecutive days. That is, each cereal was tested using a sequential-monadic design over a two day period in a randomized two out of six incomplete block design. The score sheets were designed using a nine point category scale. To analyze the data, numerical values were assigned to each category, where: 1 = Super Bad, 2 = Really Bad, 3 = Bad, 4 = Just a Little Bad, 5 = Maybe Good or Maybe Bad, 6 = Just a Little Good, 7 = Good, 8 = Really Good, and 9 = Super Good. Overall liking was rated. The data was analyzed using analysis of variance.

X4.3.2 At the bottom of each score sheet, respondents were asked to comment about the cereal. Parents/legal guardians were also invited to comment on their observations with regards to how their child reacted to the cereal.

TABLE X4.1 Children's Liking Scores

NOTE 1—Means with the same letter are not significantly different at the 95 % confidence level.

Sample	Overall Liking
Flavor #1	7.7a
Flavor #2	7.7a
Flavor #3	6.9b
Flavor #4	6.9b
Flavor #5	6.4c
Flavor #6	6.3c

TABLE X4.2 Example of Permission Slip

I, _____, the parent or legal guardian of_____, a minor (the "Participant"), hereby agree and acknowledge that the Participant may participate in home-use consumer testing conducted by (your company name). Such participation is at the sole risk of the Participant. I represent that I am aware of the nature of the food to be tested and that the participant is physically able to participate in such testing. On behalf of the Participant, I hereby release (your company name) and its officers, directors and employees from any claims, damages, losses or expenses of any nature arising out of our connection with Participant's participation in the consumer testing.
Signature: _____ Date: _____
Name: _____
Address: _____

TABLE X4.3 Example of Instructions for Home Use Test on Breakfast Cereals

Thank you again for allowing your child/children to participate in this cereal test. Included in this envelope you will find the questionnaires, two cereal samples and a small "thank you" gift for your child. When tasting these cereals, we have only a few instructions to follow:

1) Please place a single serving of cereal into a bowl and eat it with the milk you usually buy.
2) Evaluate one sample per day in the order indicated as "day 1" and as "day 2." Complete the corresponding questionnaire matching the three digit code on the package to the three digit code written on the top of the questionnaire. Have your child indicate how much he/she liked or disliked the cereal by filling in only one square under the overall liking question.
3) Please have your child complete a third questionnaire indicating how much he/she likes cereal in general.
4) The last page needs to be completed by you. It gives us information about the age and gender of your child.
5) Please return the questionnaires by (date due) using the enclosed envelope.
6) This is not a test. There is no right or wrong answer.

X4.4 Results

X4.4.1 Cereals with Flavor #1 and #2 were rated significantly higher for overall liking than the other four products. Cereals with Flavor #3 and #4 followed. In addition, the cereals with Flavor #5 and #6 were rated significantly lower for overall liking. A detailed summary of the results can be found in Table X4.1.

X4.5 Conclusions

X4.5.1 It is recommended that cereals with Flavor #1 and #2 be pursued for further product development and further consumer studies. In addition, a commercially available cereal may be used as a bench mark in future studies. Included are: (*1*) the detailed data tables, (*2*) copies of the permission sheet, and (*3*) instruction sheet, which were used in this study.