Administration Instructions

IT-MAIS

Infant-Toddler Meaningful Auditory Integration Scale

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Description

The Infant-Toddler Meaningful Auditory Integration Scale (IT-MAIS) (Zimmerman-Phillips 2000) is a modification of the Meaningful Auditory Integration Scale (MAIS) (Robbins et al. 1991). It is a structured interview schedule designed to assess the child's spontaneous responses to sound in his/her everyday environment. The assessment is based upon information provided by the child's parent(s) in response to 10 probes. These 10 probes assess three main areas: 1) vocalization behavior, 2) alerting to sounds; and 3) deriving meaning from sound. Specific scoring criteria have been developed for each of the 10 probes.

Administration

This parent-report scale is administered in an interview format. This technique avoids leading the parent to provide desired responses and also discourages yes-no answers. The questions are designed to elicit a dialogue between the examiner and informant. For example, *Tell me about the sounds that Johnny responds to in his environment,* will elicit more information from the parents than will a question posed in the following manner: *Does Johnny respond to any sounds at home?* **The IT-MAIS should only be used as an interview tool. Having parents complete the form themselves invalidates the measure.**

It is recommended that the examiner review the probes and all possible answers prior to administering the scale to a parent. Parents are instructed that they will be asked a number of questions regarding their child's responses to sound. Parents should be encouraged to think of as many examples as possible. **The examiner should record the parent's responses on the test form or score sheet. Note that credit is given only for spontaneous responses that occur without prompting. Responses that occur when the child is in a structured listening set do not receive credit.**

Part of the task requires the parent to assign percentages of the time that the child is able to consistently respond to sound in a specific situation. Some parents will have difficulty with this task. Usually the probes will heighten the parent's awareness of the targeted behavior so that in subsequent evaluations, the parental feedback becomes more accurate. Be flexible in your interview format. At times when you ask one question, parents will provide the answer to another one. If you are pressed for time, **DO NOT give the IT-MAIS to the parent to complete**, rather, try to set up a future time when you can thoughtfully conduct the interview over the phone.

Scoring

Performance is scored in terms of the total number of points accrued out of 40 possible points. Each question has a potential of 0 (lowest) to 4 (highest) points. Scoring is often based on the percentage of time that a child demonstrates specific auditory abilities (i.e. Would you say that Sally is able to do this more than 50% of the time or less than 50% of the time?). It is important to adhere to the strict scoring system described in each of the target questions.

References

Zimmerman-Phillips S, Osberger MJ, Robbins AM. Assessment of auditory skills in children two years of age or younger. Presented at the 5th International Cochlear Implant Conference, New York, NY, May 1–3, 1997.

Zimmerman-Phillips S, Robbins AM, Osberger MJ. Assessing cochlear implant benefit in very young children. *Ann Otol Rhinol Laryngol Suppl.* 2000;109(12):42-43.

Robbins AM, Renshaw JJ, Berry SW. Evaluating meaningful auditory integration in profoundly hearing impaired children. *Am J Otol.* 1991;2(Suppl):144-150.

1 Is the child's vocal behavior affected while wearing his/her sensory aid (hearing aid or cochlear implant)?

The benefits of auditory input are often apparent first in the speech production skills of very young children. The frequency and quality of vocalizations may change when the device is put on, turned off, or not working properly.

1. **Ask the parent:** *Describe _____'s vocalizations when you first put his/her device on each day.* Have the parent explain how and if the child's vocalizations change when the sensory aid is first turned on and auditory input is experienced at the start of each day.
2. **Ask the parent:** *If you forget to put the device on ____, or if the device is not working properly, do you and/or others notice that ____'s vocalizations are different in any way (e.g., quality, frequency of occurrence)?*
3. **Or ask:** *Does the child test the device by vocalizing when the device is first turned on?*

_____ **0 = Never**
No difference in the child's vocalizations with the device turned on versus the device turned off.

_____ **1 = Rarely**
Slight increase in the frequency of the child's vocalizations (approximately 25%) with the device on (or similar decrease with the device off).

_____ **2 = Occasionally**
Child vocalizes throughout the day, and there are increases in vocalizations (approximately 50%) with the device turned on (or similar decrease with the device turned off).

_____ **3 = Frequently**
Child vocalizes throughout the day, and there are noticeable increases in vocalizations (approximately 75%) with the device on (or a similar decrease with the device off). Parents may report that individuals outside the home notice a change in the frequency of child's vocalizations with or without the device.

_____ **4 = Always**
Child's vocalizations increase 100% with the device on compared to the frequency of occurrence with the device turned off.

PARENT REPORT: _____

2 Does the child produce well-formed syllables and syllable-sequences that are recognized as speech?

This type of utterance is characteristic of the speech of developing infants. The utterances contain speech sounds and syllables that are recognized as speech by the parents. Parents often assert the baby is "talking."

1. **Ask the parent:** *Does _____ "talk" to you or to objects?*
2. **Ask the parent:** *As_____ plays alone, what kinds of sounds do you hear when the device is on?*
3. **Ask the parent:** *Does _____ say sounds and words used in nursery rhymes or playing with toys?* (e.g., hop hop, moo, baaa, choo choo, mmmmm).
4. **Ask the parent:** For specific examples of the types of utterances the child produces, as well as the frequency with which they are produced.

_____ **0 = Never**
Child never produces speech-like utterances, child only produces undifferentiated vocalizations, or the parents cannot give any examples.

_____ **1 = Rarely**
Child produces speech-like utterances once in awhile (approximately 25% of the time), but only when provided with a model (spontaneous imitation).

_____ **2 = Occasionally**
Child produces speech-like utterances 50% of the time when provided with a model (spontaneous imitation).

_____ **3 = Frequently**
Child produces these utterances approximately 75% of the time; parents can give many examples. Child produces the syllable sequences spontaneously, but with a limited phonetic repertoire. The child can clearly and reliably imitate sequences with a model (spontaneous imitation).

_____ **4 = Always**
Child produces syllable-sequences consistently and on a spontaneous basis (i.e., without a model). The utterances consist of a varied repertoire of sounds.

PARENT REPORT: _____

3 Does the child spontaneously respond to his/her name in quiet with auditory cues only (i.e., no visual cues) when not expecting to hear it?

Infants and toddlers demonstrate a variety of behaviors in response to sound. Examples of such responses in very young children may be: momentary cessation of an activity (e.g. stops moving, playing, sucking, crying), searching for the sound source (e.g., looks up or around after hearing their name), widening or blinking their eyes.

1. **Ask the parent:** *If you called _____'s name from behind his/her back in a quiet room with no visual cues, what percentage of the time would s/he respond the first time that you called his/her name?* Many young children commonly demonstrate an off-response when auditory stimulation stops; any repeatable behavior is considered a response, provided the child demonstrates the behavior consistently.
2. **Ask the parent:** For specific examples of the types of responses that the parent observes, especially to assign the highest ratings.

_____ **0 = Never**
Child never responds to his/her name, or the parents cannot give any examples.

_____ **1 = Rarely**
Child responds to his/her name only about 25% of the time on the first trial, or only with multiple repetitions.

_____ **2 = Occasionally**
Child responds to his/her name about 50% of the time on the first trial, or does it consistently but only after the parent repeats the name more than once.

_____ **3 = Frequently**
Child responds to his/her name at least 75% of the time on the first trial.

_____ **4 = Always**
Child responds to his/her name reliably and consistently on the first trial.

PARENT REPORT: _____

4 Does the child spontaneously respond to his/her name in the presence of background noise with auditory cues only (i.e., no visual cues)?

1. **Ask the parent:** *If you called _____'s name from behind his/her back with no visual cues in a noisy room (e.g., people talking, children playing, the TV on), what percentage of time would s/he respond to you the first time that you called his/her name?* Use the response criteria specified in Question 3 to score the parent's observations. Remember that in general, the younger the child, the more subtle the responses observed. Rather than overt responses to stimuli such as searching for the source of the sound, a cessation in activity or a freezing behavior is commonly observed. As long as the behavior is observed consistently, it is considered a response.
2. **Ask the parent:** For specific examples of the types of responses that the parent observes.

_____ **0 = Never**
Child never responds to his/her name in noise, or the parents cannot give any examples.

_____ **1 = Rarely**
Child responds to his/her name in noise about 25% of the time on the first trial, or only with multiple repetitions.

_____ **2 = Occasionally**
Child responds to his/her name in noise about 50% of the time on the first trial, or does it consistently but only after the parents repeat the name more than once.

_____ **3 = Frequently**
Child responds to his/her name in noise at least 75% of the time on the first trial.

_____ **4 = Always**
Child responds to his/her name in noise reliably and consistently on the first trial.

PARENT REPORT: _____

5 Does the child spontaneously alert to environmental sounds (dog, toys) in the home without being told or prompted to do so?

1. **Ask the parent:** *Tell me about the kinds of environmental sounds to which _____ responds at home and in familiar situations (e.g., grocery store, restaurant, playground) without prompting. Give me examples.* Question parents to be sure the child is responding via audition, without visual cues.
2. **Ask the parent:** To provide specific examples, such as alerting to the telephone, TV, dog barking, smoke alarm, toys that make sounds (e.g., music boxes, music mobiles see-and-say toys, horns honking, dishwasher, microwave bell). The child must alert spontaneously to the sound without prompting from the parent. Recall that very young children demonstrate various responses to sound including momentary cessation of activity, searching for the sound source, widening and/or blinking their eyes. Young children often respond when a sound ceases, rather than at the onset. Any repeatable behavior is considered a response provided it is demonstrated consistently.

_____ **0 = Never**
Child never demonstrates the behavior, the parents cannot give any examples, or child responds only after a prompt.

_____ **1 = Rarely**
Child responds about 25% of the time to different sounds. Parents can give only one or two examples, or give several examples of sounds that the child responds to on an inconsistent basis.

_____ **2 = Occasionally**
Child responds about 50% of the time to more than two environmental sounds. If there are a number of sounds that regularly occur to which the child does not alert (even if he consistently responds to two sounds such as the phone and the doorbell), assign a score no higher than Occasionally.

_____ **3 = Frequently**
Child consistently responds to many environmental sounds at least 75% of the time.

_____ **4 = Always**
Child basically responds to all environmental sounds reliably and consistently.

PARENT REPORT: _____

6 Does the child spontaneously alert to environmental sounds in new environments?

1. **Ask the parent:** *Does _____ show curiosity (verbal or nonverbal) about sounds when in unfamiliar settings (e.g., such as in someone else's home, unfamiliar store, or a restaurant without being prompted?).* Examples include clanging dishes in a restaurant, bells dinging in a department store, PA system in public buildings, baby crying in another room, smoke alarm, an unfamiliar toy at a playmate's home. A younger child may provide nonverbal indications that s/he has heard a new sound with eye-widening, a frown or a smile, searching for the source of the new sound, imitation of the new sound (such as when playing with a new toy), starting to cry after a loud or unusual sound, or looking to a parent for information. The response behaviors may be demonstrated when the sound is first detected or when it ceases.

_____ **0 = Never**
Child never demonstrates the behavior or the parents cannot give any examples.

_____ **1 = Rarely**
Child demonstrates the behavior but does so only about 25% of the time; parents can give only one or two examples of this behavior.

_____ **2 = Occasionally**
Child demonstrates the behavior numerous times (about 50%) of the time, and parents can give a number of different examples.

_____ **3 = Frequently**
Child demonstrates the behavior about 75% of the time, parents can give many different examples, and responses are a common occurrence.

_____ **4 = Always**
Very few new sounds occur without the child showing a response or curiosity about them.

PARENT REPORT: _____

7 Does the child spontaneously RECOGNIZE auditory signals that are part of his/her everyday routines?

1. **Ask the parent:** *Does _____ regularly recognize or respond appropriately to auditory signals at daycare, preschool, or in the home with no visual cues or other prompts?* Examples of this may be looking for a familiar toy that the child hears but cannot see, looking at the microwave when it goes off or the telephone when it rings, looking at the door when the dog is outside barking, wanting to come in the house, looking at the door when hearing the garage door opening, putting hands over his/her eyes if you stand behind the child and verbally initiate an interactive play game such as "Peek-a-boo." Other games include "Pat-a-cake" or "So Big."

_____ **0 = Never**
Child never demonstrates the behavior, or the parents cannot give any examples.

_____ **1 = Rarely**
Parents can give one or two examples of the behavior. Child responds to these signals 25% of the time. If there are a number of sounds that occur regularly to which the child does not alert, assign a score no higher than Occasionally.

_____ **2 = Occasionally**
Parents can provide more than two examples. Child responds to these signals about 50% of the time.

_____ **3 = Frequently**
Parents can give many examples. Child demonstrates consistent response to these signals at least 75% of the time.

_____ **4 = Always**
Child clearly has mastered this skill and routinely responds to auditory signals that are part of everyday routines. There are very few sounds that the child does not recognize within the daily routine.

PARENT REPORT: _____

8 Does the child demonstrate the ability to discriminate spontaneously between two speakers with auditory cues only (i.e., no visual cues)?

Examples of this behavior include discriminating between the voices of mother or father and that of a sibling, or discriminating between the voices of mother and father. Examples of this behavior may be attending/responding to the parent who spoke when only auditory cues are present.

1. **Ask the parent:** Can _____ tell the difference between two voices, like Mom or brother/sister, just by listening to them?
2. **At a more difficult level ask:** *If _____ is playing with two siblings and one sibling spoke, would _____ look in the direction of the appropriate brother/sister?*

_____ **0 = Never**
Child never demonstrates the behavior, or the parents cannot give any examples.

_____ **1 = Rarely**
Child can discriminate between two very different voices (adult/child) about 25% of the time. Ask parents to provide examples.

_____ **2 = Occasionally**
Child can discriminate between two very different voices (adult/child) about 50% of the time. Ask parents to provide examples.

_____ **3 = Frequently**
Child discriminates between two very different voices (adult/child) 75% of the time; sometimes discriminates between two similar voices (e.g., voices of two children). Ask parents to provide examples.

_____ **4 = Always**
Child always discriminates between two very different voices; very often discriminates between two similar voices.

PARENT REPORT: _____

9 Does the child spontaneously know the difference between speech and non-speech stimuli with listening alone?

The purpose of this question is to evaluate whether the child has categorical perception between speech and non-speech stimuli. We address this by inquiring about instances where the child may confuse these two stimuli, or show that s/he is not confused. For example, if a child has an established response to certain stimuli (e.g. rocking in response to music), does s/he ever exhibit this behavior in response to speech stimuli?

1. **Ask the parent:** *Does _____ recognize speech as a category of sounds that are different from non-speech sounds?* For example, if you are in a room with your child and you called to him/her, would s/he look for you or for a favorite toy?
2. **Ask the parent:** *Does _____ ever search for a family member's voice versus looking for a familiar toy?*

_____ **0 = Never**
Child does not know the difference between speech versus non-speech stimuli, or parents cannot give any examples.

_____ **1 = Rarely**
Child demonstrates speech/non-speech distinction about 25% of the time; parents can give only one or two examples. Child often confuses speech and non-speech stimuli.

_____ **2 = Occasionally**
Child demonstrates speech/non-speech distinction at least 50% of the time; parents can give a number of different examples.

_____ **3 = Frequently**
Child demonstrates speech/non-speech distinction at least 75% of the time; parents can give many different examples.

_____ **4 = Always**
Child consistently and reliably demonstrates the behavior; child makes essentially no errors in discriminating speech from non-speech stimuli.

PARENT REPORT: _____

10 Does the child spontaneously associate vocal tone (anger, excitement, anxiety) with its meaning based on hearing alone?

In the very young child, does the child recognize changes in emotion conveyed by voice associated with the use of motherese or chiild-directed speech? Examples of this include laugh or coo in response to large fluctuations in the intonation or changes in voice and upset when scolding or told firmly *no-no*, even with no substantial increase in the loudness of the voice.

1. **Ask the parent:** *By listening only, can _____ tell the emotion conveyed in someone's voice such as an angry voice, an excited voice, etc.?* (e.g., Mother yells, and child startles and cries in response or child laughs or smiles in response to changes in intonation and prosody in parents' voices without seeing their faces).

_____ **0 = Never**
Child does not demonstrate the behavior, parents cannot give any examples, and child has no opportunity to show the behavior.

_____ **1 = Rarely**
Child demonstrates the behavior about 25% of the time. Ask parents to provide examples.

_____ **2 = Occasionally**
Child demonstrates the behavior about 50% of the time. Ask parents to provide examples.

_____ **3 = Frequently**
Child demonstrates the behavior about 75% of the time. Ask parents to provide examples.

_____ **4 = Always**
Child consistently and appropriately responds to a range of vocal tones. Parents can provide numerous examples.

PARENT REPORT: _____

SCORE SHEET

Infant-Toddler Meaningful Auditory Integration Scale (IT-MAIS)

Name _____ Informant _____ Date ___ / ___ / ___

Examiner _____ Device _____ Interval _____

Question	Never	Rarely	Occasionally	Frequently	Always	Parent Report
1	0	1	2	3	4	
2	0	1	2	3	4	
3	0	1	2	3	4	
4	0	1	2	3	4	
5	0	1	2	3	4	
6	0	1	2	3	4	
7	0	1	2	3	4	
8	0	1	2	3	4	
9	0	1	2	3	4	
10	0	1	2	3	4	

TOTAL SCORE _____ /40

To request additional copies of the IT-MAIS Score Sheet or Administration Instructions, please contact Advanced Bionics at:

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