
The MacKay-Kummer SNAP Test- R

Simplified Nasometric Assessment Procedures

Revised 2005

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The MacKay-Kummer SNAP Test was developed in 1994 to improve the diagnostic value of nasometry and to make administration easier with children and non-compliant patients. In 2005, the SNAP Test was updated to improve the ease of scoring, and it was re-normed using the Nasometer II.

Specific Advantages of the MacKay-Kummer SNAP Test

The specific advantages of the SNAP Test over other normed passages are as follows:

- Can be used effectively with young children or individuals with minimal compliance
- Does not require literacy
- Contains passages that are semantically, pragmatically, and lexically simple
- Can be used with individuals who demonstrate articulation/phonological errors
- Is fast and easy to administer
- Has pictures for cueing children
- Allows the examiner to isolate certain phonemes for better diagnostic value

Description of the SNAP Test

The SNAP Test includes the following three subtests:

1. The **Syllable Repetition/Prolonged Sounds Subtest** includes 14 consonant-vowel (CV) syllables of pressure-sensitive consonants combined with either a low vowel (/a/) or a high vowel (/i/). In addition, there are two prolonged vowels and two prolonged consonants. The Syllable Repetition/Prolonged Sounds Subtest provides phonetic specificity for in-depth analysis.
2. The **Picture-Cued Subtest** contains passages that are essentially phonetically homogeneous. For each passage, a carrier phrase is used with pictures to form complete sentences. Each passage has three pictures, to elicit three sentences. Each sentence is said twice, making 6 sentences per passage. In this subtest, there is a passage that focuses on each of the following: bilabial plosives, lingual-alveolar plosives, velar plosives, sibilant fricatives, and nasals.
3. The **Reading Subtest** consists of two short, easy-to-read passages; one loaded with plosives and the other loaded with sibilants. The reading passages are more heterogeneous phonetically than the other two subtests, but are still more homogeneous than the “phonetically-balanced” passages that are often used in clinical nasometry.

Administration of the SNAP Test

Administration of all the subtests is not necessary in a routine nasometric evaluation. Instead, specific passages of a subtest could be selected, depending on the patient's articulation and the diagnostic information being sought.

Using the Contour display, follow the standard operating procedures for data collection and analysis as noted in Chapters 2, 3, 4. The specific instructions for eliciting each passage are as follows:

1. The **Syllable Repetition/Prolonged Sounds Subtest**: Ask the patient to repeat the syllables at a "normal" speed until the screen is full of relatively even peaks and the first couple of syllables have disappeared to the left. Approximately 6–10 syllables should be produced during the 2-second period. The vowels should be prolonged to fill the screen.
2. The **Picture-Cued Subtest**: Model the three sentences of the passage for the child. Then ask the child to say the sentences with the pictures used as cues. Ask the child to repeat the set of three sentences so that there are a total of six sentences produced for the passage. The clinician may make use of printed copies of the pictures or may use the images displayed on the computer screen. The sentences could also be printed if the patient is a reader.
3. The **Reading Passages Subtest**: There are two different reading passages provided in the Reading Passages Subtest. Each one may be used separately with patients who are accomplished readers. Ask the patient read the passage aloud, including the title.

General Guidelines

In choosing subtests or specific passages for assessment, the following guidelines should be kept in mind:

- Do not use a reading passage unless the patient can read without unnatural hesitations, revisions, and production errors.
- Do not use a picture-cued passage unless the patient can produce it without basic errors in the production task, or serious delays, revisions, or production errors.
- Do not use a passage of any subtest that is beyond the patient's phonological competence.

Normative Data

Normative data was obtained from a group of children, ranging in age from 3 years to 9 years, for the Syllable-Repetition (N=272), the Prolonged Sounds (N=68), the Picture-Cued Subtest (N=231) and the Reading Subtest (N=149). These values were obtained in the Cincinnati area with midwestern speakers who had no apparent speech or language problems. The values reported are collapsed across age and sex and are rounded for simplicity. Further research is needed to determine whether these values are similar for adult speakers.

Difference between Nasometer I and Nasometer II

In comparing the normative data between Nasometer I and Nasometer II, certain trends are evident. For the oral passages, there is a tendency for the mean scores on Nasometer II to be about one percentage point lower than Nasometer I and for the standard deviations to be 1 or 2 points greater. On the nasal cued speech subtest, the mean on Nasometer II is 2 points lower than Nasometer I and the standard deviation is 2 points greater.

The biggest difference between the two Nasometer versions occurred on the nasal syllables. On these syllables, the scores on Nasometer II are about 6-8 percentage points lower than Nasometer I and the standard deviations are about 5-7 points greater.

In summary, with the exception of the nasal syllables, the scores for Nasometer II are slightly lower than Nasometer I and the standard deviations are slightly greater. The scores from both Nasometer I and II are well below the scores that would affect perceptual judgments of nasalance and therefore, these differences are not considered clinically significant.

Score Sheet

The score sheet for the SNAP Test contains the mean of all of the mean nasalance scores (in the Norm column) and standard deviations (SD's) for each subtest item. A column is included for reporting the patient's score and another column is given for noting if the score seems to be outside the approximate normal range.

In the Syllable Repetition/Prolonged Sounds Subtest, the International Phonetic Association Alphabet (IPAA) was used. As such, the [a] represents the vowel in the expression "ah" and the [i] represents the vowel in the word "see." The consonants have their expected sounds, except that the "sh" sound is represented phonetically as [ʃ].

Threshold Values

As reported by others, threshold values are somewhat arbitrary for several reasons. First, there is not a perfect correlation between the speech characteristics and the nasometer score. Second, resonance and nasalance scores occur on a continuum. Therefore, there is a wide "grey" area between normal and abnormal that can be considered borderline. Finally, the scores can not be interpreted as if there is a normal curve distribution.

When there is a normal curve, there is an equal distribution of scores above the mean and scores below the mean. With oral passages, the scores do not fall in a normal curve because these passages have low norms. As a result, there is much more room for individual scores to exceed the norm than there is for scores to be lower than the mean. For example, a score of 42 on the syllable [pa] can occur with a moderate degree of velopharyngeal dysfunction. Since for this passage, the normative mean is 6 and one standard deviation is 3, the score of 42 is 12 standard deviations above the mean. However, in the opposite direction, only 3 standard deviations below the mean represents an impossible score because it would be less than zero.

With nasal passages, the opposite is generally true. The normative mean for the syllable [ni] is 71 with a standard deviation of 13. This value is closer to the upper limit on nasalance scores (namely 100) and therefore, there is more room for lower scores than for higher scores.

The threshold value for each test is an approximation of the beginning of a borderline range of abnormal resonance. These values were estimated based on standard deviations (about two higher for orals, and one lower for nasals) and clinical experience. It should be noted that a small number of normal speakers will score outside two standard deviations of the mean for both orals and nasals. Therefore, the suggested threshold values should be used as general guidelines and not as absolute markers between normal and abnormal resonance.

Nasalance scores should never be used in isolation for diagnosis or treatment planning. Instead, they should be used to complement other diagnostic procedures. Clinicians should always base their decisions regarding normal or abnormal speech primarily on the perceptual findings. However, nasometry is very useful as a means to obtain objective measures to support clinical judgment and to quantify changes as a result of treatment.

Clinical Interpretation

In addition to the general information given in this manual on interpretation of the nasogram, the following are some considerations when using the SNAP Test:

- The expected difference between vowels /a/ and /i/ are about 10 points with oral sounds and about 20 points with nasal sounds.
- If either /s/ or /sh/ are high and others are normal, consider phoneme-specific nasal emission due to a posterior nasal fricative.
- If lingual-alveolars and bilabials are significantly higher than velars, consider the effect of a fistula.
- If vowels are high, but prolonged /s/ is zero, consider a thin velum, high tongue position, or vowel-specific nasality.
- If there is a normal nasalance score, but high spikes are noted on the nasogram, consider a nasal rustle (turbulence), which indicates a small velopharyngeal gap.
- If the oral scores are in the 20s, consider nasal emission in the absence of hypernasal resonance.

Reference

Kummer, AW. "Nasometry." In: Kummer, AW. Cleft Palate and Craniofacial Anomalies: The Effects on Speech and Resonance, Clifton Park, NY: Thomson Delmar Learning, 2001.

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