Oral Motor Complexity Score: Organizing Speech Therapy Targets by Difficulty

Structured speech therapy worksheets with items selected and organized based on the complexity of oral movements required to produce each word or syllable.

Introduction

These speech therapy worksheets are designed to support individuals with a range of speech and language difficulties. They are especially helpful for young children (ages 3–6) with developmental speech disorders such as Childhood Apraxia of Speech (CAS), as well as for adults with motor speech impairments like dysarthria or other speech production and expressive language challenges. Unlike the general word banks available on my website, which are sorted by individual speech sounds for each consonant, these new worksheets contain monosyllabic words and syllables organized using a structured, multi-factor scoring system. This system increases clinical relevance by allowing words to be selected based on their complexity and the client's current skill level. Some words also appear in the general word banks, but these therapy worksheets are arranged to enable gradual progression from simpler to more complex speech targets.

The worksheets focus on monosyllabic words and syllables containing a target consonant sound used in therapy (e.g., /b/). Scoring applies only to the target consonant and its immediate context, allowing focused practice on specific articulatory goals. By organizing words and syllables from easiest to most challenging based on five factors—consonant sound acquisition, place of articulation, vowel placement, consonant clusters, and word shape—the worksheets provide clinicians and caregivers with a practical tool to select therapy targets that align with a client's current abilities, supporting steady and effective progress in speech-language intervention.

Scoring System

Each word or syllable is scored based on five factors that quantify the complexity of oral movements required for production:

1. **Consonant Sound Acquisition**
   Consonants are scored based on the typical age of acquisition in children:
   - Score 1: Early sounds (ages 2–3), e.g., /b/, /p/, /m/, /n/, /w/, /h/
   - Score 2: Mid sounds (ages 3–4), e.g., /t/, /d/, /k/, /g/, /f/, /ŋ/, /j/ ("y")
   - Score 3: Later sounds (age 5), e.g., /v/, /s/, /z/, /ʧ/ ("ch"), /ʤ/ ("j")
   - Score 4: Latest sounds (age 6+), e.g., /l/, /r/, /ʃ/ ("sh"), /ʒ/ ("measure"), /θ/ ("voiceless th"), /ð/ ("voiced th")

   The scores of all consonants in a word are summed to calculate the total consonant score.
2. **Place of Articulation**
   When consonant scores are equal, this factor determines relative difficulty. Consonants produced at the front of the mouth are simpler:
   - Score 1: Front sounds (lip-based, bilabial), e.g., /b/, /p/, /m/
   - Score 2: Middle sounds (tongue-tip, alveolar, labio- or interdental), e.g., /t/, /d/, /n/, /s/, /z/, /l/, /r/, /f/, /v/, /θ/, /ð/
   - Score 3: Back sounds (post-alveolar, palatal, velar, glottal, labiovelar), e.g., /k/, /g/, /ŋ/, /ʃ/, /ʒ/, /ʧ/, /ʤ/, /j/, /w/, /h/

   Scores for all consonants are summed.
3. **Vowel Placement**
   Vowels are scored based on tongue position, with front vowels being easier:
   - Score 1: Front vowels, e.g., /i/ ("see"), /ɪ/ ("sit"), /e/ ("say"), /æ/ ("cat")
   - Score 2: Middle vowels, e.g., /ʌ/ ("cup"), /ə/ ("sofa")
   - Score 3: Back vowels, e.g., /u/ ("too"), /ʊ/ ("book"), /ɑ/ ("father"), /ɔ/ ("law"), /o/
   - Score 3: Diphthongs Score 3: Diphthongs, e.g., /aɪ/ ("buy"), /aʊ/ ("cow"), /ɔɪ/ ("boy"), /eɪ/ ("say"), /oʊ/ ("go")
4. **Consonant Cluster Rule**
   Words are divided into two groups based on the target consonant /b/:
   - Group 1: /b/ is adjacent to a vowel or diphthong (e.g., "bee," "boil"), simpler to articulate.
   - Group 2: /b/ is part of a consonant cluster (e.g., "bulb," "brick"), more complex.

   Group 1 words are prioritized as easier targets.
5. **Word Shape**
   When other scores are equal, word shape determines order:
   - Simpler shapes (e.g., CV: "bee"; CVC: "bin") precede complex shapes (e.g., CCVC: "brick"; CVCC: "bulb").
   - Shorter words are prioritized over longer ones to reduce initial complexity.

Word Examples and Therapeutic Rationale

The following table summarizes the scoring for four example words containing /b/, ordered from easiest to most complex, based on the five criteria. Detailed explanations follow, illustrating how each word's scores contribute to its therapeutic value.

Word	Consonant Score	Place Score	Vowel Score	Cluster Group	Word Shape	Total Score
Bee	1 (/b/)	1 (/b/)	1 (/i/)	Group 1	CV	3
Bin	2 (/b/, /n/)	3 (/b/, /n/)	1 (/ɪ/)	Group 1	CVC	6
Bulb	6 (/b/, /l/)	4 (/b/, /l/)	2 (/ʌ/)	Group 2	CVCC	12
Brick	7 (/b/, /r/, /k/)	6 (/b/, /r/, /k/)	1 (/ɪ/)	Group 2	CCVC	14

Bee

1. **Consonant Sound Acquisition**:
   One consonant, /b/ (score 1, acquired ages 2–3). Total: 1.
   Early-acquired sounds allow beginners to succeed, building confidence.
2. **Place of Articulation**:
   /b/ is a bilabial stop consonant (score 1), produced by closing both lips to stop airflow.
   Bilabial articulation is simple, ideal for early learners.
3. **Vowel Placement**:
   /i/ ("see") is a high front vowel (score 1), with the tongue positioned high and forward, requiring minimal movement for ease of production.
4. **Consonant Cluster Rule**:
   Group 1 (no cluster), reducing articulatory demands.
5. **Word Shape**:
   CV (consonant-vowel), the simplest shape, minimizing motor planning

Total Score: 3
Therapeutic Value: "Bee" is easy because it uses an early-acquired bilabial stop consonant, a high front vowel, no consonant cluster, and a simple CV shape. It is ideal for beginners, allowing focused practice on /b/ with minimal motor planning demands, promoting early success in therapy.

Bin

1. **Consonant Sound Acquisition**:
   Two consonants, /b/ (score 1, acquired ages 2–3) and /n/ (score 1, acquired ages 2–3). Total: 2.
   Early-acquired sounds keep the word accessible for beginners.
2. **Place of Articulation**:
   /b/ is a bilabial stop consonant (score 1), produced by closing both lips to stop airflow;
   /n/ is an alveolar nasal consonant (score 2), produced with the tongue tip at the alveolar ridge and nasal airflow. Total: 3.
   The alveolar articulation adds slight complexity.
3. **Vowel Placement**:
   /ɪ/ ("sit") is a near-high front vowel (score 1), with the tongue positioned forward and slightly below the high position, simplifying articulation.
4. **Consonant Cluster Rule**:
   Group 1 (no cluster), maintaining ease of articulation.
5. **Word Shape**:
   CVC (consonant-vowel-consonant), requiring coordination for the final consonant

Total Score: 6
Therapeutic Value: "Bin" is slightly more challenging than "bee" due to its second early-acquired consonant (/n/) and CVC shape, which requires sequencing a final consonant. The bilabial stop and alveolar nasal consonants, paired with a near-high front vowel, keep articulation manageable while promoting fluency and motor planning skills for beginners.

Bulb

1. **Consonant Sound Acquisition:**
   Two consonants, /b/ (score 1, acquired ages 2–3) and /l/ (score 4, acquired age 5-6+). Total: 6.
   The later-acquired /l/ increases difficulty.
2. **Place of Articulation:**
   /b/ is a bilabial stop consonant (score 1), produced by closing both lips to stop airflow;
   /l/ is an alveolar lateral approximant (score 2), produced with the tongue tip at the alveolar ridge and air passing laterally.
   Total: 4.
   Combining bilabial and alveolar articulation requires more coordination.
3. **Vowel Placement:**
   /ʌ/ ("cup") is a mid central vowel (score 2), with the tongue positioned centrally at mid height, adding moderate articulatory complexity.
4. **Consonant Cluster Rule:**
   Group 2 (/lb/ cluster), increasing articulatory complexity.
5. **Word Shape:**
   CVCC (consonant-vowel-consonant-consonant), demanding advanced sequencing.

   Total Score: 12
   Therapeutic Value: "Bulb" is more challenging than "bee" or "bin" due to its later-acquired alveolar lateral approximant (/l/), mid central vowel, consonant cluster, and complex CVCC shape. It is suitable for intermediate clients ready to work on harder sounds and structures, enhancing articulatory precision and motor planning skills.

Brick

1. **Consonant Sound Acquisition:**
   Three consonants, /b/ (score 1, acquired ages 2–3), /r/ (score 4, acquired age 6+), and /k/ (score 2, acquired ages 3–4). Total: 7. The late-acquired /r/ significantly increases difficulty.
2. **Place of Articulation:**
   /b/ is a bilabial stop consonant (score 1), produced by closing both lips to stop airflow;
   /r/ is an alveolar approximant (score 2), produced with the tongue tip near the alveolar ridge;
   /k/ is a velar stop consonant (score 3), produced with the tongue back at the velum to stop airflow.
   Total: 6; The velar articulation with alveolar approximant requires sophisticated tongue and velum control.
3. **Vowel Placement:**
   /ɪ/ ("sit") is a near-high front vowel (score 1), with the tongue positioned forward and slightly below the high position, balancing complexity with simpler articulation.
4. **Consonant Cluster Rule:**
   Group 2 (/br/ cluster), requiring precise timing.
5. **Word Shape:**
   CCVC (consonant-consonant-vowel-consonant), a complex shape demanding advanced sequencing.

   Total Score: 14
   Therapeutic Value: The velar stop (/k/) demands precise coordination of the tongue and velum to fully stop airflow, while the alveolar approximant (/r/) requires intricate tongue shaping and fine control of airflow. Additionally, the co-articulation of all sounds in the word (/brɪk/) involves complex motor planning, making the word especially challenging to produce.

Therapeutic Benefits of the Scoring System

Each factor ensures therapy targets are tailored to a client's abilities, supporting incremental progress:

- **Consonant Sound Acquisition**:
  Early sounds (e.g., /b/, /n/ in "bee," "bin") are easier for young children or those with significant speech challenges, enabling early success and confidence. Later sounds (e.g., /l/, /r/ in "bulb," "brick") challenge clients as they progress.
- **Place of Articulation**:
  Front sounds (e.g., /b/ in all words) are simple, requiring only lip movement, ideal for beginners. Middle (e.g., /n/, /l/ in "bin," "bulb") and back sounds (e.g., /k/ in "brick") introduce more complex tongue movements, fostering articulatory growth.
- **Vowel Placement**:
  Front vowels (e.g., /i/, /ɪ/ in "bee," "bin," "brick") minimize tongue movement, suitable for early learners. Middle vowels (e.g., /ʌ/ in "bulb") require more tongue control, supporting skill development.
- **Consonant Cluster Rule**:
  Group 1 words (e.g., "bee," "bin") are easier, as they lack clusters, ideal for early therapy.
  Group 2 words (e.g., "bulb," "brick") challenge clients to blend consonants, enhancing sequencing skills.
- **Word Shape**:
  Simple CV and CVC shapes (e.g., "bee," "bin") are easy for beginners, while complex CVCC and CCVC shapes (e.g., "bulb," "brick") require advanced coordination, improving motor planning.

Using the Worksheets in Speech Therapy

The scoring system enables speech-language pathologists (SLPs) and caregivers to select words tailored to a client's needs, grounded in evidence-based principles of speech sound development and motor planning. For example, a young child with speech sound disorders or an adult with dysarthria may start with simpler words like "bee" or "bin" to practice foundational phonemes and articulatory shapes. These early targets are ideal for building confidence and skills, regardless of age. For adults, age-appropriate words are chosen to ensure relevance, but the same principles of articulatory simplicity apply as for children. This structured approach is particularly valuable for parents and caregivers, who may lack deep clinical knowledge but can use the system's clear progression to support therapy at home. Future iterations will include additional consonants to enhance applicability for clients with diverse articulation challenges.

Development and Practical Application

The scoring system was developed to provide a systematic, evidence-informed method for selecting therapy targets based on articulatory complexity. Drawing on clinical research in speech sound acquisition and motor planning, it offers a practical tool for SLPs to plan therapy and track progress while making the process accessible to caregivers. Unlike intuitive word selection often used by experienced SLPs, this framework quantifies word difficulty, bridging the gap for parents and non-experts. It fills a void in standardized tools for motor planning-based word selection and is designed to evolve through clinical use and research.

Limitations and Future Directions

Grounded in established principles of speech sound development, articulatory complexity, and motor planning, this scoring system is a novel tool that requires further validation through research and clinical application to confirm its effectiveness across diverse populations with speech and motor speech disorders. It complements clinical judgment and individualized assessment, serving as a flexible guide for therapy planning. Ongoing use and feedback will refine its utility for both SLPs and caregivers.

Contact and Collaboration

We welcome feedback, questions, or collaboration from clinicians, researchers, and caregivers. Please use the contact form on our website to discuss the system, share experiences, or contribute to its development.