

Phonological Assessment & Treatment Target Selection

Name: _____ Grade: _____ DOB: _____ Analysis Date: _____

Part 1. Characterization (Assessment Information)

The success of a treatment program depends entirely on the overall assessment of the sound system. An extra *hour* spent on a thorough assessment can reduce amount of *weeks* spent in treatment.

1. **Phonetic Inventory.** Circle the phones in the child's phonetic inventory that occurred twice or more in the probe sample. Write in and circle any other allophones or non-target phones that also occurred (e.g., p^h, ts, ʒ or w^r). List OUT phones to the right.

	Bilabial	Labio-dental	Inter-dental	Alveolar	Palato-Alveolar	Palatal	Velar	Glottal
Stops	p b			t d			k g	
Fricatives		f v	θ ð	s z	ʃ ʒ			
Affricates					tʃ dʒ			
Nasals	m			n			ŋ	
Liquids				l		r		
Glides	w					j		h

Target Phones OUT

2. **Phonemic Inventory.** Circle the phonemes from the child's *phonetic* inventory that showed a contrast in meaning at least twice in the sample in order to determine the *phonemic* inventory. (Use the Minimal Pair Worksheet to identify minimal pair contrasts for each phoneme.) Write in and circle any other non-target phonemes that also occurred (e.g., ts, ʒ or w^r). List OUT phonemes to the right.

	Bilabial	Labio-dental	Inter-dental	Alveolar	Palato-Alveolar	Palatal	Velar	Glottal
Stops	p b			t d			k g	
Fricatives		f v	θ ð	s z	ʃ ʒ			
Affricates					tʃ dʒ			
Nasals	m			n			ŋ	
Liquids				l		r		
Glides	w					j		h

Target Phonemes OUT

3. **Word Initial Cluster Inventory (Organized by Sonority Distance).** Circle the word-initial clusters that occurred at least twice in the sample. Write in and circle any other non-target (or non-probed) clusters that also occurred twice (e.g., pw- [6], tl- [5], bw- [5], dw- [5], fw- [4], θw- [4]).

SD=6	SD=5	SD=4	SD=3	SD=2	SD=-2	/s/CC
tw-	bj-	br-	fr-	mj-	sp-	skw-
kw-	pr-	dr-	θr-	sm-	st-	spr-
pj-	tr-	gr-	ʃr-	sn-	sk-	str-
kj-	kr-	bl-	fl-			skr-
	pl-	gl-	sl-			spl-
	kl-	fj-	vj-			
		sw-				

Target Clusters OUT
SD=6
SD=5
SD=4
SD=3
SD=2
SD=-2
/s/CC

4. **Stimulability.** Record stimulability of OUT phones from (1) above. (Use the Glaspey & Stoel-Gammon (2005) task to gain information about what sounds a child can produce with some level of support.)

Stimulable OUT phones: _____ Nonstimulable OUT phones: _____

Part 2. Reorganization (Target Selection Based on Language Universals and Treatment Efficacy Research)

Target selection occurs in a step-by-step fashion based on the results of the individual child's overall assessment (adapted from Gierut, 2004; Morrisette, Farris, & Gierut, 2006).

- Step 1. Determine if (3-element) /s/CC clusters are appropriate targets.** Are any /s/CC clusters present in the Cluster Inventory? (Refer to (3) in Part 1.)

Yes. Then /s/CC clusters aren't appropriate targets. Go on to **Step 2**.

No. Then /s/CC clusters may be appropriate targets. Answer questions (a) and (b) below.

a. **Is /p/ or /t/ or /k/ an IN phoneme?** (Refer to (2) under Part 1.) If **yes**, list: _____ (C2)

b. **Is /w/ or /l/ or /r/ an IN phoneme?** (Refer to (2) under Part 1.) If **yes**, list: _____ (C3)

If you answered **No** to (a) or (b), then /s/CC clusters aren't appropriate targets. Go on to **Step 2**.

If you answered **Yes** to (a) and (b), /s/CC clusters may be appropriate targets if the IN phonemes can occur as C2 and C3 (respectively) in any of the clusters below. If so, **circle** the relevant cluster. You've selected your treatment target and you can now go on to **Part 3: Monitoring**. If the IN phonemes don't form any of the clusters below, then /s/CC aren't appropriate. Go on to **Step 2** to continue with target selection. (Note that /s/ doesn't need to be in the inventory in order to target /s/CC clusters.)

/s/CC Target: skw- spr- str- skr- spl-

Step 2. Determine if (2-element) CC clusters are appropriate targets. Refer back to (3) in **Part 1**. Using the chart below, follow the step-by-step instructions in (a) through (e), in order.

Cluster Target Pool

SD=6	SD=5	SD=4	SD=3	SD=2	SD=-2	/s/CC
tw-	bj-	br-	fr-	mj-	sp-	skw-
kw-	pr-	dr-	θr-	sm-	st-	spr-
pj-	tr-	gr-	ʃr-	sn-	sk-	str-
kj-	kr-	bl-	fl-			skr-
	pl-	gl-	sl-			spl-
	kl-	fj-	vj-			
		sw-				

- Cross out all IN clusters. If your pool is now empty, go on to **Step 3**; otherwise, go on to (b).
- Cross out all SD=-2 clusters (sp-, st-, sk-) and C/j/ clusters (e.g., vj-, mj-). If your pool is now empty, go on to **Step 3**; otherwise, go on to (c).
- What is the child’s minimum sonority distance (excluding SD=-2 clusters)? Identify the minimum sonority difference (MSD) produced by the child. Cross out all OUT clusters that have a SD that is equal to or larger than the minimal SD of the child’s IN clusters. For example, if the child’s smallest SD cluster was /kl-/ (SD=5), you would cross out those clusters with a SD of 5 or larger. Note that the child does not need all clusters with a particular sonority distance; one representative cluster is sufficient. (If the child did not produce any clusters, you won’t cross out any clusters.) If your pool is now empty, go on to **Step 3**; otherwise, go on to (d).
- If the pool lacks /sw-/, /sl-/, /sm-/, and /sn-/, go on to (e). If any of these clusters are in the pool, list the errors for these targets (e.g., /sn-/ → [n] or /sl-/ → [s]) and compare these with errors on /sp- st- sk-/ and non-/s/ clusters. If errors on /sw-, sl-, sm-, sn-/ are similar to /sp- st- sk-/, cross out those clusters; otherwise, keep them in the pool. If the error patterns are unclear, cross out those clusters. This is your revised target pool. If your pool is now empty, go on to **Step 3**; otherwise, go on to (e).

Target	Error	Target	Error	Non-/s/ CC	Error
sw-		sp-			
sl-		st-			
sm-		sk-			
sn-					

- From your revised Cluster Target Pool, circle those have the *smallest* sonority difference. If more than one cluster target is circled, select the cluster that includes OUT phones (refer to Phonetic Inventory in (1) under **Part 1**). This is your treatment target; enter it below. You can now go on to **Part 3: Monitoring**.

CC Target: _____

Step 3. Select a Singleton Target. Enter all OUT phones below, as based out your Phonetic Inventory analysis in (1) under **Part 1**. Then follow the step-by-step instructions in (a) through (d), in order.

	Bilabial	Labio-dental	Inter-dental	Alveolar	Palato-Alveolar	Palatal	Velar	Glottal
Stops								
Fricatives								
Affricates								
Nasals								
Liquids								
Glides								

- Cross out all stimulable sounds. (Refer to (4) under **Part 1**.)
- Cross out all early-acquired sounds. This would include [p b t d k g f v m n ŋ w j h] for English.
- Of those remaining in your revised pool, CIRCLE those sounds that lead to greater system-wide change, based on language laws. (Refer to Implicational Laws on page 5.)
- If multiple sounds remain, select the sound or sound(s) that occur most frequently in the sound system. The following is the order of English consonant frequency (most-least): /t n r l s d z m ð k w b h v f p ŋ j g θ ʃ dʒ tʃ ʒ/. This is your treatment target; enter it below. You can now go on to **Part 3: Monitoring**.

Singleton Target: _____

Part 3. Monitoring (Treated and Untreated Sounds)

To evaluate change following treatment, all OUT singletons and clusters (from (1) and (3) in **Part 1**) should be monitored during baseline measures and following termination of treatment on the selected target. Those singletons and clusters that remain absent following treatment should be placed into the pool for target selection for the next phase of treatment.

Monitoring:

Phones	Phonemes	Clusters

Selected Treatment Target: _____

Determine the frequency and type of progress monitoring: _____

Sample Type (*e.g., conversational*) **Frequency** (*e.g., weekly*) **Next Probe Date:** _____

Evidence in Support of the Guidelines

1. Treatment on structure that is absent from the sound system is consistent with a goal of achieving *underlying change in linguistic knowledge*, as opposed to a *surface change in behavior* (Gierut, 2005; Johnston, 1988).
2. Treatment of 3-element clusters will lead to improvements on 2-element /s/ clusters, 2-element obstruent + sonorant clusters, liquids, and affricates, as well as other singleton consonants absent from the pretreatment inventory (Anderson, 2002; Barlow, 2005; Elbert & McReynolds, 1979; Gallagher & Shriner, 1975; Gierut, 1998, 1999; Gierut & Champion, 2001; Gierut & O'Connor, 2002; Lleó & Prinz, 1997; Maas, Barlow, Robin, & Shapiro, 2002; Williams, 1986, 1988).
3. Treatment of 2-element obstruent + sonorant clusters that have a small sonority distance will lead to improvement on 2-element clusters with a large sonority distance, plus liquids, and affricates, as well as other singleton consonants absent from the pretreatment inventory (Anderson, 2002; Barlow, 2005; Broselow & Finer, 1991; Eckman, 1991; Eckman & Iverson, 1993; Elbert, Dinnsen, & Powell, 1984; Elbert & McReynolds, 1979; Gallagher & Shriner, 1975; Gierut, 1998, 1999; Gierut & O'Connor, 2002; Lleó & Prinz, 1997; Powell & Elbert, 1984; Williams, 1986, 1988).
4. Treatment of /s/ clusters, particularly /s/ + stop clusters, leads to only limited generalization to other clusters in the sound system, due to their different patterning in the sound system and relatively early acquisition by children (Barlow, 2001b; Gierut, 1999; Smit, 1993; Smit, Hand, Freilinger, Bernthal, & Bird, 1990).
5. Consonant + /j/ clusters pattern differently from other clusters and are acquired relatively in acquisition of English (Barlow, 1997a, 1997b, 2001a).
6. Treatment on sounds that are excluded from the inventory and subject to obligatory errors leads to greater system-wide change and is consistent with a goal of achieving *underlying change in linguistic knowledge*, as opposed to a *surface change in behavior* (Brière, 1966; Gierut, 1990, 1991, 1992, 2005; Gierut, Elbert, & Dinnsen, 1987; Gierut & Neumann, 1992; Hammerly, 1982; Hardy, 1993; Johnston, 1988; Williams, 1991).
7. Stimulable sounds are likely to emerge on their own without direct treatment; thus, treatment should focus on those aspects of the sound system that are least likely to emerge without direct treatment (Dinnsen & Elbert, 1984; Elbert & McReynolds, 1978; Miccio, Elbert, & Forrest, 1999; Powell, 1993; Powell, Elbert, & Dinnsen, 1991; Sommers et al., 1967).
8. Greater system-wide change occurs following treatment on later-acquired as opposed to early-acquired sounds (Dyer, Santarcangelo, & Luce, 1987; Gierut, Morrisette, Hughes, & Rowland, 1996; Powell, 1991; Powell, Elbert, Miccio, Strike Roussos, & Brasseur, 1998).
9. Implicational laws of language require that certain hierarchical relationships be maintained in a system. Presence of a higher-order structure necessarily requires presence of implied lower-order structure (Greenberg, 1978; Ladefoged & Maddieson, 1996; Lindblom & Maddieson, 1988; Maddieson, 1984). Refer to examples below.
10. Improving sounds that are frequently occurring in the sound system will have a greater impact on intelligibility (Edwards, 1983).

Implicational Laws

Structures on the left are considered to be more marked (more complex) relative to the structure on the right. Teaching these marked structures results in changes in the implied structures. For example, teaching clusters improves affricates.

3-Element /s/CC Clusters → 2-Element /s/ and Non-/s/ Clusters (Gierut & Champion, 2001; Maas et al., 2002)

Clusters with a Small Sonority Distance → Clusters with a Large Sonority Distance (Gierut, 1999)

Clusters → Singletons (Gallagher & Shriner, 1975)

Clusters → Affricates (Gierut, 2008; Gierut & O'Connor, 2002)

Stridency contrast (e.g., [θ s] or [ð z]) → Liquid (Dinnsen, Chin, & Elbert, 1992; Dinnsen, Chin, Elbert, & Powell, 1990)

Liquids → Nasals (Dinnsen et al., 1990; Gierut, Simmerman, & Neumann, 1994; Tyler & Figurski, 1994)

Affricates → Fricatives (Gierut et al., 1994; Ingram, Christensen, Veach, & Webster, 1980; Schmidt & Meyers, 1995)

Fricatives → Stops (Cataño, Barlow, & Moyna, 2009; Dinnsen & Elbert, 1984; Elbert et al., 1984)

Voiced Obstruents → Voiceless Obstruents (Cataño et al., 2009; Dinnsen & Elbert, 1984; McReynolds & Jetzke, 1986)

Velars → Coronals (Stoel-Gammon, 1996)

Stops in Final Position → Stops in Initial Position (Rockman, 1983)

Fricatives in Initial Position → Fricatives in Final Position (Smith, 1973)

Consonants → Vowels (Robb, Bleile, & Yee, 1999)

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