

## Chapter 9

# Parents and children together in phonological intervention

PACT is an acronym for a family-centred phonological assessment and intervention approach to speech sound disorders called *Parents and Children Together* (Bowen, 2010; Bowen & Cupples, 2006). PACT could just as easily stand for ‘parents and child, and therapist’ and implies an arrangement in which all are actively involved in the intervention process, while the name itself reflects the child and family focus of the approach. Administered in planned blocks and breaks, PACT is termed ‘broad-based’ because, while concentrating mostly on the phonemic (phonological or cognitive–linguistic) level, it *also* takes account of phonetic and auditory perceptual factors. This is because the difficulties children diagnosed with phonological disorders experience may not be exclusively ‘phonological’. PACT directly targets speech perception and production, and hence intelligibility, in children with phonological disorder. It may also indirectly impact morphosyntax and phonological awareness (particularly phonemic awareness) and hence literacy acquisition. In Chapter 9, PACT is described and illustrated with a case study of Josie, augmented by a contribution by Debbie James in A50, relating to issues that arose.

More PACT information can be accessed at [www.speech-language-therapy.com](http://www.speech-language-therapy.com). Click on the ARTICLES tab in the header of any page, and go to ‘Intervention’. On that page are links to four PACT-related pages: *Implementation*, *Publications*, *Theory and Evidence* and *Therapy for Josie*. On the latter page is a slide show about Josie’s intervention and progress, and links to activities and resources used in treating her severe phonological disorder that involved a mix of phonemic, perceptual and phonetic issues.

### Primary population

PACT was designed for 3- to 6-year olds and validated as an effective treatment for children in this age range diagnosed with mild, moderate and severe phonological disorders (Bowen, 1996a; Bowen & Cupples, 1999a, b). The children in the efficacy study were typical of children with intelligibility difficulties in that they did not necessarily have ‘pure’ phonological disorder. Whereas children with language impairment, including SLI, were excluded from the study, and each of the children’s major communication difficulty was

at the phonological level, the major contributing component was often accompanied by phonetic execution and auditory perceptual difficulties. Moreover, some participants were treated for stuttering (Unicomb, Hewat, Spencer & Harrison, 2013) during the intervention process.

### Why 3- to 6-year olds?

We had a twofold rationale for developing a therapy for pre-schoolers and younger school children. First, intelligibility difficulties may be obvious in 2- and 3-year olds (Dodd, A10; McIntosh & Dodd, 2011), but diagnosis of SSD is usually elusive until sometime in a child's fourth year. Withholding intervention, however, until diagnosis is 'definite' can prove counterproductive in the longer term. Second, we wanted to develop an intervention that families could access before their children started formal schooling, potentially 'catching' many of the children before they were busy (and often tired) and inaccessible – in the sense of not wanting to miss school – to attend speech therapy, and pre-empting or minimising literacy acquisition difficulties.

### Secondary populations

Clinicians have reported acceptable outcomes with PACT with other populations, but such implementation has not been tested experimentally. The 'other' children have included 3;0- to 6;11-year olds with language processing and production issues *and* SSD; and children with speech production issues  $\leq 10$  years with SLI;  $\leq 10$  years with pragmatic issues; growing up bilingual (and multilingual; Goldstein, A19; McLeod, Verdon & Bowen, 2013; Ray, 2002) and with developmental delay; as well as children with clefts, autism spectrum disorder, Down syndrome, Fragile X syndrome, Williams syndrome and cochlear implants. Although not designed specifically for children with CAS, it has been incorporated, with integral stimulation (Strand, Stoeckel & Baas, 2006), and compatible techniques that follow the principles

of motor learning (Schmidt & Lee, 2011), to help treat children diagnosed with CAS.

### Theoretical basis

PACT is based on the assumptions that phonemic change is (1) gradual and motivated by homophony (Grunwell, 1987); (2) enhanced through metalinguistic awareness of phones (the phonetic level) and the phonemic system (the phonological level); and (3) facilitated by heightened perceptual saliency of contrasts because it increases their learnability. PACT embraces the foundations of all minimal pair approaches (Fey, 1992) by systematically modifying groups of sounds produced in error; emphasising the elimination of homophony (i.e., different words pronounced the same way) and the establishment of feature contrasts to mark meaning distinctions, rather than putting the spotlight on accurate sound production; and making it explicit to children that the function of phonology is communication. This is achieved in PACT by working at word level and above, using naturalistic parent-child communicative contexts, increasing the child's (and parents') metaphonological awareness, and targeting, as required, phonological, phonetic, phonotactic and perceptual goals.

### Empirical support

In the efficacy study, a longitudinal matched groups design was employed, with assessment, treatment and reassessment (probe) phases. Fourteen children were treated under typical clinical conditions, and treatment was withheld from eight matched children on waiting lists. At probe, the treated children showed accelerated and highly selective improvement in their productive phonology [ $F(1,20) = 19.36$ ,  $P < 0.01$ ], whereas the untreated eight did not. No such selective improvement was observed in the treated children in either receptive vocabulary or Mean Length of Utterance in Morphemes, attesting to the specific effect of the therapy. PACT is practicable (Robey &

Schultz, 1998) under conditions of everyday practice in terms of the in-clinic component (Bowen & Cupples, 1998, 1999a), and it is feasible and often enjoyable for interested families implementing homework and follow-up away from the clinic (Bowen & Cupples, 2004).

## Assessment

A 200-utterance conversational speech (CS) sample, or a 200-word CS sample, and single words (SWs) elicited using the *Quick Screener* (Bowen, 1996b, after Dean, Howell, Hill & Waters, 1990) usually provide sufficient data to allow independent and relational analyses (Stoel-Gammon, A9) and diagnosis, or provisional diagnosis, of phonological impairment. Additional testing is sometimes necessary, and this might entail administration of the DEAP (Dodd, Crosbie, Zhu, Holm & Ozanne, 2002) or the HAPP-3 (Hodson, 2004), the Locke Speech Perception Task (Locke, 1980; see Tables 8.6a and 8.6b), and an imitative PCC (Johnson, Weston & Bain, 2004). Speech assessment within the PACT approach, whether initial or ongoing, is integral to intervention. As parents play a central role in management, it is highly desirable for them to be aware—through observation, participation and explanation—of the speech-language assessment process. Essential components of data gathering are the case history interview; an audiological evaluation by an Audiologist; screening for language, pragmatics, voice and fluency strengths and difficulties; an oral musculature examination; and, as noted above, a CS sample of 200 utterances, if possible, remembering that, for some children, single word tokens may predominate. Within the case history interview, parents are asked to provide an intelligibility rating using a scale of 1–5: (1) completely intelligible; (2) mostly intelligible; (3) somewhat intelligible; (4) mostly unintelligible; and (5) completely unintelligible. This is recorded at the top of the *Quick Screener* data collection form displayed in Figure 9.1.

If the child's output is so unintelligible that the clinician cannot even guess the content, or if time

is short or the child's cooperation difficult to establish, an imitative PCC procedure is used rather than the conversational PCC procedure (Flipsen Jr., A11). Johnson et al. (2004) found that PCCs derived from conversational samples did not differ significantly from PCCs drawn from sentence imitation, using age-appropriate vocabulary, syntax and representative distribution of speech sounds in children aged 4–6. They concluded that 'the sentence imitation procedure offers a valid and efficient alternative to conversational sampling'. In their experiment, an almost wordless picture book, *Carl Goes to Daycare* (Day, 1993), provided visual stimuli for the repetition task, and the 36 short sentences, potentially containing 273 consonants, the children repeated after the examiner included, 'Watch them dance', 'He got cold', and 'Time to go home'.

## Quick Screener

Speech assessment begins with the administration of the *Quick Screener*, while parents observe, using the data collection form displayed in Figure 9.1. The SLP/SLT phonetically transcribes in full, with necessary diacritics, the child's production of the first word 'cup' and immediately assigns a score that goes in the 'CC' (consonants correct) column. For example, if the child says [kʌp] the score is 2; if he or she says [kʌ], [ʌp], [tʌp] or [gʌp] the score is 1; and if he or she says [ʌ] or [tʌ] the score is zero. Each word is scored for consonant production in this way. There are approximately 100 consonants in the sample, depending on the dialect of English, so a tentative single-word PCC can be estimated quickly, with parents watching, by adding the figures in the CC columns and calling the sum a percentage. For example, if the child scores 55 consonants correct, his or her tentative PCC, or screening PCC, is 55%. There is also provision on the form to record vowel errors. The vowel and diphthong targets on the data collection form reflect non-rhotic Australian English. Therapists working with children speaking other varieties of English can change the vowel symbols, and 'vowelless' forms are

### Quick Screener

SINGLE-WORD SCREENING SAMPLE USING THE METAPHON STIMULUS VOCABULARY <small>Dean, E., Howell, J., Hill, A., &amp; Waters, D. (1990). Metaphon Resource Pack. Windsor, Berks: NFER Nelson</small>														
Date of Birth					Observer(s)									
Today's date					Examiner									
① completely intelligible ② mostly intelligible ③ somewhat intelligible ④ mostly unintelligible ⑤ completely unintelligible														
#	TARGET	TRANSCRIPTION	CC	#	TARGET	TRANSCRIPTION	CC							
1	cup	ʌ		23	jam	æ								
2	gone	ɒ		24	house	aʊ								
3	knife	aɪ		25	path	a								
4	sharp	a		26	door	ɔ								
5	fish	ɪ		27	smoke	oʊ								
6	kiss	ɪ		28	bridge	ɪ								
7	sock	ɒ		29	train	eɪ								
8	glass	a		30	chair	εə								
9	watch	ɒ		31	red	ε								
10	nose	oʊ		32	spoon	u								
11	mouth	aʊ		33	plane	eɪ								
12	yawn	ɔ		34	fly	aɪ								
13	leaf	i		35	sky	aɪ								
14	thumb	ʌ		36	sun	ʌ								
15	foot	ʊ		37	wing	ɪ								
16	toe	oʊ		38	splash	æ								
17	snake	eɪ		39	tent	ε								
18	van	æ		40	salt	ɒ								
19	fast	a		41	crab	æ								
20	girl	ɜ		42	sweet	i								
21	stairs	εə		43	sleeve	i								
22	big	ɪ		44	zipper	ɪ ə								
Check ɔɪ boy ɪə ear			SUBTOTAL CC:					TOTAL CC:						
TENTATIVE single word phonetic inventory (≈100 consonants in sample) and PVC (47 vowels/diphthongs in sample)														
Vowels	i	ɪ	ε	æ	a	ʌ	ə	ɜ	ɒ	ɔ	ʊ	u	Vowels correct (47)	%
Obstruents	p	b	t	d	k	g	f	v	STIMULABILITY				Consonants correct (≈ 100)	%
Obstruents	θ	ð	s	z	ʃ	ʒ	tʃ	dʒ					MARKED p t k f v	
Sonorants	m	n	ŋ	l	r	w	j	h					θ ð s z ʃ ʒ tʃ dʒ	
List phonological processes/record observations														

**Figure 9.1** The Quick Screener data collection form. From Bowen (1996b), after Dean et al. (1990).

available at [www.speech-language-therapy.com](http://www.speech-language-therapy.com). If the child mispronounces the vowel or diphthong in a word, the vowel or diphthong is circled by the therapist and later tallied to calculate a screening, single-word, percentage of vowels correct (PVC) using the formula  $\text{VOWELS CORRECT} \div 47 \times 100 = \text{PVC}$  (again, while parents observe). It should be remembered that the PCC and the PVC derived from the screener are *screening* (tentative) measures, although it has been observed clinically that there is little variation in PCC and PVC scores between data gathered via the *Quick Screener* and larger data sets.

Using the *Quick Screener* analysis form displayed in Figure 9.2, the clinician summarises the child's phonological processes as percentages of occurrence, if this is considered useful, and records pertinent observations, including the therapist's own intelligibility rating. These outcomes are discussed in the child's hearing. It is explained to parents that the child's continued presence during discussion demonstrates to the child that his or her parents are important partners in the therapy process. It also helps to acknowledge parents, up front, as the homework experts and experts where their own child is concerned.

The word set contained in *Quick Screener* is based on the *Metaphon Resource Pack Screening Test* developed by Dean et al. (1990) with the word 'gun' changed to 'gone'. The stimulus pictures, data collection forms and analysis form are freely available at [www.speech-language-therapy.com](http://www.speech-language-therapy.com). Word productions can be elicited using the *Metaphon Resource Pack Screening Test* easel book (now unfortunately out of print), or the *Quick Screener* pictures presented as a slide show, or printed on cards. I prefer the slide show option, not least because children usually find it interesting and fun, and, quite remarkably, frequently ask to do it 'again'! The data collection form has space for recording stimulability data and the child's inventory of marked consonants. In stimulability testing, the child is asked to directly imitate vowels in isolation and CVs, usually [ba bi bu] etc. focusing on vowels and diphthongs already circled on the form; and consonants of interest in CV or VC contexts, or both, but not usually in

isolation. Marked consonants in the child's inventory are circled, from a choice of /p t k f v θ ð s z ʃ ʒ tʃ dʒ/. The stimulability and markedness data are later used in the decision-making process for treatment target selection, as outlined in Chapter 8.

## Assessing progress

It is usual to reassess, using the *Quick Screener*, with parent observation, at the beginning of each intervention block (immediately after a break from intervention), allowing parents, who are often particularly interested in the inventories and percentages, to observe and discuss any changes. Additional testing may be required; for example, the DEAP, HAPP-3 or the Locke Task might be repeated. Any decision to terminate or continue therapy is made jointly with parents (see Baker, 2010 for thoughtful discussion).

## Goals and goal attack

Table 1.3 provides a schema within which to view three levels of intervention goal. The basic goal of PACT is to work at word level or above to encourage phonological reorganisation, thus facilitating the emergence of clear speech. This basic goal is achieved by increasing a child's consonant, vowel, syllable-shape, syllable-stress, phonotactic and suprasegmental repertoires and accuracy; and by promoting generalisation of new segments, structures and prosodic features to increasingly challenging contexts and situations. The intermediate goal is to target groups of sounds related by an organising principle (processes, rules or patterns), addressing phonetic and perceptual levels as required. Specific intervention goals are to target a sound, sounds or syllable structures, using horizontal strategies: targeting several sounds within a sound class or manner of production, or syllable structure category, and/or targeting more than one process or deviation or structure simultaneously.

<b>Velar fronting</b>					
#	Target SI	0 / 1	#	Target SF	0 / 1
1	cup		7	sock	
6	kiss		17	snake	
2	gone		22	big	
20	girl		37	wing	
TOTAL		/4	TOTAL		/4

<b>Palato-alveolar fronting</b>					
#	Target SI	0 / 1	#	Target SF	0 / 1
4	sharp		5	fish	
30	chair		9	watch	
23	jam		28	bridge	
TOTAL		/3	TOTAL		/3

<b>Word-final devoicing</b>					
#	Target	0 / 1	#	Target	0 / 1
41	crab		43	sleeve	
31	red		10	nose	
22	big		28	bridge	
TOTAL		/6	TOTAL		/6

<b>Backing</b>					
#	Target SI	0 / 1	#	Target SF	0 / 1
16	toe		15	foot	
39	tent		42	sweet	
26	door		31	red	
TOTAL		/3	TOTAL		/3

<b>Stopping of fricatives</b>					
#	Target SI	0 / 1	#	Target SF	0 / 1
5	fish		13	leaf	
15	foot		11	mouth	
14	thumb		6	kiss	
7	sock		38	splash	
36	sun		43	sleeve	
4	sharp		10	nose	
18	van				
44	zip(per)				
TOTAL		/8	TOTAL		/6

<b>Stopping of affricates</b>					
#	Target SI	0 / 1	#	Target SF	0 / 1
30	chair		9	watch	
23	jam		28	bridge	
TOTAL		/2	TOTAL		/2

<b>Pre-vocalic voicing</b>					
#	Target	0 / 1	#	Target	0 / 1
25	path		5	fish	
16	toe		14	thumb	
6	kiss		36	sun	
			4	sharp	
TOTAL		/7	TOTAL		/7

<b>Liquid/glide simplification</b>					
#	Target	0 / 1	#	Target	0 / 1
9	watch		12	yawn	
13	leaf		31	red	
TOTAL		/4	TOTAL		/4

<b>Initial consonant deletion</b>					
#	Target	0 / 1	#	Target	0 / 1
3	knife		7	sock	
22	big		30	chair	
18	van		12	yawn	
TOTAL		/6	TOTAL		/6

<b>Final consonant deletion</b>					
#	Target SI	0 / 1	#	Target SF	0 / 1
23	jam		10	nose	
44	zip		5	fish	
31	red		28	bridge	
TOTAL		/6	TOTAL		/6

<b>Initial cluster reduction</b>					
#	Target SI	0 / 1	#	Target SI	0 / 1
33	plane		43	sleeve	
8	glass		27	smoke	
28	bridge		17	snake	
29	train		32	spoon	
41	crab		21	stairs	
34	fly		35	sky	
42	sweet		38	splash	
TOTAL		/14	TOTAL		/14

<b>Final cluster reduction</b>					
#	Target	0 / 1	#	Target	0 / 1
19	fast		40	salt	
39	tent				
TOTAL		/3	TOTAL		/3

Figure 9.2 Quick Screener analysis form



Goal selection and attack strategies are primarily therapist-driven and explained to parents. Multiple goals are addressed in and across treatment sessions and within homework, sequentially and simultaneously, and rarely cyclically. For example, Emeline, 5;1, in Session 4 of her second therapy block, had three concurrent goals. First, a phonetic goal to produce /dʒ/ and /tʃ/ in onset and coda in six practice words; second, a phonological goal to recognise distinctions in input, and to mark distinctions in output in short phrases between the cognate pairs /p b/, /t d/ and /k g/ (e.g., with Emeline instructing and adult to 'Touch the *pea/bee*', 'Touch the *toe/doe*', 'Touch the *cap/gap*'; and then switching roles); and a generalisation goal to use the voiceless fricatives /f/, /s/ and /ʃ/ in conversational speech in untrained words in the therapy session and during an agreed daily period at home.

## Materials and equipment

The materials and equipment required consist of toys, vowel and consonant pictures on cards and worksheets, a 'speech book' (exercise book, ring binder or scrapbook), drawing and 'making' materials and equipment, rewards such as stamps and stickers, a desktop, laptop or tablet computer for slide shows and the administration of the *Quick Screener* and an audio recorder to record therapy snippets. It is helpful but not essential for the family to have a computer and audio recorder. One option is for them to use a tablet (e.g., iPad or Android) and an inexpensive voice recorder App such as *iTalk Recorder Premium* from Griffin Technology (<http://store.griffintechology.com/italk-premium>). Pictures in speech books and on cards usually include printed captions to clarify what the target words are meant to be. Captions are printed consistent with the way in which early literacy instruction is commonly delivered, with all words printed in lower case, and capital letters used only for the beginnings of proper nouns. Suitable pictures are available to clinicians and families, at no cost, at [www.speech-language-therapy.com](http://www.speech-language-therapy.com).

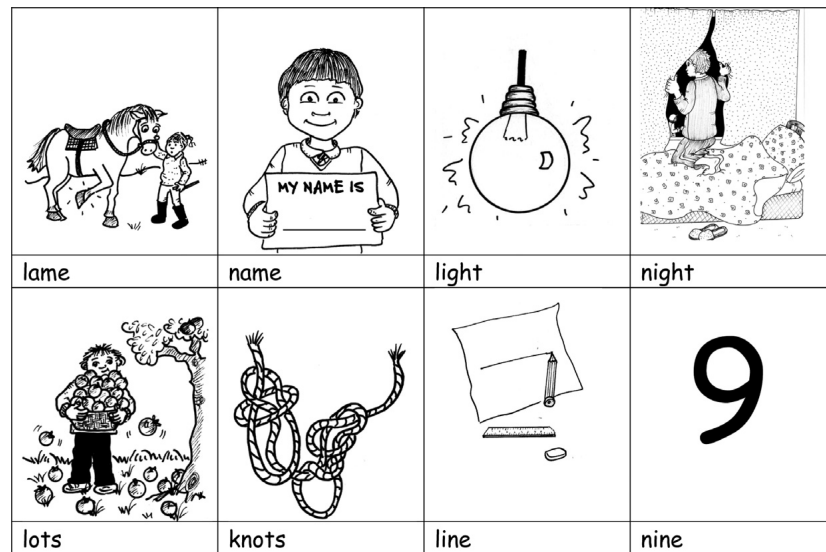
## Intervention

### Therapy sessions

The clinician sees the child for 50–60 minutes (usually 50 minutes) once per week in therapy blocks. The minimum parent participation involves the parent joining the therapist and child for 20 minutes at the end of a session, or 10 minutes at the beginning and end; and the maximum parent participation sees parents staying 50–60 minutes. The parent assumes the role of a dynamic collaborator in a treatment triad with child and therapist. Segments of parent participation always require the child's continued involvement, to properly demonstrate what should happen at home. The following is an outline of a 50-minute session for Iain, 5;7, with his father Gordon and a therapist, towards the end of his second treatment block (of three) in which one treatment target was addressed.

Iain had a persistent [n] for /l/ sound replacement SIWI, and over the previous 2 weeks, had *finally* become stimulable for /l/ in CVs by dint of every phonetic placement technique the therapist knew—or at least it felt that way! Gordon left Iain with the therapist for 15 minutes while he dropped his wife Lucinda at a railway station and took 7-year old Bruce to school, returning for the final 35 minutes of the session with Iain's brother Fergus, 18 months, who played happily alone while work proceeded. Iain had already engaged in items 1–3 with the therapist.

1. Rhyming auditory bombardment using five pictured, captioned (in lower case printing), minimal pairs: *snip-slip*, *snap-slap*, *snow-slow*, *snug-slug*, *sneak-sleek*, was presented. The pairs were spoken to Iain at a comfortable conversational loudness level, and then he played a quick game of 'Point to the one I say', with the therapist saying the words and Iain pointing.
2. Next was auditory input cloze with the same captioned pictures, with Iain saying the sn-words that he was already able to pronounce correctly: Adult: *Slow* rhymes with . . . Iain:



**Figure 9.3** /l/ versus /n/ minimal word pairs. Drawings by Helen Rippon, Speech and Language Therapist, [www.blacksheepress.co.uk](http://www.blacksheepress.co.uk)

- snow* Adult: *Slap* rhymes with . . . Iain: *snap*, etc.
- A minimal pairs 'silent sorting' task followed. Four cards (*name*, *night*, *knots* and *nine*) were placed on the table, and Iain was encouraged to 'think the words' as he placed a rhyming word (from a choice of *lame*, *light*, *lots* and *line*) beside each (see Figure 9.3).
  - Gordon began participating in the session at this point. Iain was shown a page of pictures of *late*, *lei*, *lap*, *let*, *light*, *lock*, *lick*, *lame*, *lead*, *lit* and *lice*, and told, 'This time, Iain, you be the teacher and tell me if I say these words the right way or the wrong way'. Taking the role of 'student', Gordon made deliberate random errors, emulating Iain's sound replacement (e.g., 'Nate' for 'late', 'neigh' for 'lei', 'nap' for 'lap' as single word inputs or in short utterances, e.g., 'He is *late* for school' vs. 'He is *Nate* for school'). All Iain had to do was tell the 'student' whether he was right or wrong without modelling correct pronunciation.
  - The therapist, and then Gordon, presented a 'fixed-up-one routine' for /n/ versus /l/.
  - The clinician presented a homophony confrontation task with *lei-neigh*, *lap-nap*, *lame-name* and *low-no*, and this was the one task not included in homework.
  - All three rehearsed a Knock-Knock joke (Knock, knock. Who's there? Lettuce. Lettuce who? Lettuce in!). This was then recorded several times on the same recording, with Iain saying 'Lettuce' and 'Lettuce in' and his father saying 'Who's there' and 'Lettuce who?'
  - The auditory bombardment was delivered again and recorded, so that it followed the 'lettuce' humour. It consisted of *snip-slip*, *snip-slap*, *snow-slow*, *snug-slug*, *sneak-sleek*, as in item one above, followed by 15 words in sequence: *leaf*, *lamb*, *lock*, *label*, *lead*, *lie*, *lake*, *lion*, *lip*, *letter*, *lunch*, *llama*, *lamp*, *lettuce*.
  - Homework, comprising activities 2–4 and 6–8, was explained by the clinician, demonstrated by the clinician and Iain, and then rehearsed by Iain and Gordon. Iain tried the Knock-Knock joke out on his father several more times, and the recording with the joke and bombardment sequences, with a running time of 2.5 minutes, was played.
  - In the context of putting 'children' on a toy school bus, Gordon, therapist, and Iain sang 'Lettuce-in, lettuce-in, lettuce-in', 'Lettuce-go, lettuce-go, lettuce-go', and 'Lettuce-out, lettuce-out, lettuce-out' to the tune of 'Here



we go, here we go, here we go' on the recording to take home, increasing the running time to 4 minutes.

11. How to reinforce /l/ using frequent recasting was discussed with Gordon (parent education), and suggestions for thematic play were made around the words 'llama' and 'line' and making up more words for the 'lettuce song' ('Lettuce stop', 'Lettuce start', 'Lettuce see', etc.). They were to do all the activities except number 6 at home, and instructions and pictures were included in Iain's speech book for Lucinda, who shared over half the homework-load with Gordon.

## Intervention scheduling

A unique feature of PACT is its administration in planned blocks and breaks (Bowen & Cupples, 2004) that are intended to

- accommodate the gradualness of speech acquisition, mimicking typical development;
- allow for spurts and plateaus in development;
- make 'space' for consolidation of new speech skills;
- make 'space' for phonological generalisation;
- make 'space' for untrained spontaneous gains; and
- provide periodic respite, allowing families to refresh and regroup.

## Dosage

The initial block and break are usually about 10 weeks each, and then the number of therapy sessions per block tends to reduce while the period between blocks remains more or less constant at 10 weeks. A typical schedule is 10 weeks on, 10 weeks off, 8 weeks on, 10 weeks off, 4–6 weeks on. It is suggested to parents that, during the breaks, they do no formal practice for up to 8 weeks. In the 2 weeks prior to the next block, they are asked to enjoy looking through the speech book with the child a few times and to do any activities the child wants to do. Although they do not do homework or revision in the breaks, the child's

parents continue to provide modelling corrections, reinforcement of revisions and repairs and pursue metalinguistic activities, incidentally, as opportunities arise, using the strategies learned in 'parent education' in the therapy block(s).

Typically those children with phonological disorder *only* have needed a mean of 21 consultations for their output phonology to fall within age-expectations, so many are ready for discharge at the end of their second block (about 30 weeks after initial assessment) or immediately after their second break (about 40 weeks after initial assessment). A small number of children engaged in PACT have required a third block; fewer have needed four; and there is no record of a child needing more than four treatment blocks. Children with phonological disorder as well as mild language or fluency difficulties have required about the same volume of therapy for speech, but most have continued having intervention for longer to address their other, non-speech goals.

## Target selection

Like goal selection and attack, target selection (with exceptions like Shaun's wanting to work on /ʃ/ to pronounce his own name correctly) is therapist-driven, and the reasons certain targets are given preferential treatment are explained to parents. As part of a stopping pattern, Shaun, 4;9, mentioned in Chapter 8, called himself 'Dawn'. An adult neighbour whose name actually was Dawn, apparently oblivious to the misery it evoked and angry requests from Shaun to 'Stop it', teased him endlessly to the point where *all* he and his mother were interested in doing in therapy was to work on /ʃ/ in just one word – *Shaun* (which we did, with a successful outcome). In selecting treatment targets, the clinician uses linguistic criteria, taking into account motivational factors and attributes of the child and parents; is flexible in terms of feature contrasts; and applies evidence and clinical judgement. Traditional and newer criteria (see Table 8.1 and the discussion that follows it) may be applied to isolating optimal targets.

Sometimes it is necessary to fall back on other, more traditional criteria. Take Tessa for example

(Bowen, 2010). Superficially, Tessa 5;10, was a perfect candidate for a least knowledge approach using high-frequency lexical targets because she had a phonetic inventory of only 13 consonants, a PCC of 38%, and extensive homophony. Or *was* she? She was a fretful, diffident child with wary, apprehensive parents, ready to abandon therapy if the clinician attempted anything 'too hard'. These three were unsuited to complex maximal oppositions or empty set feature contrasts, for which Tessa had least knowledge. They needed to ease into intervention via a gentler, albeit less potent, approach using unmarked, stimula-ble, inconsistently erred, early developing sounds; low-frequency words with low neighbourhood density; and minimal feature contrasts. Once they were all ready to trust the clinician's target choices and confront more difficult tasks, Tessa took more risks, handling the challenges of multiply opposed word sets within the Multiple Exemplar Training component of PACT.

## PACT components

PACT has five dynamic and interacting components: Parent Education (Family Education), Metalinguistic Training, Phonetic Production Training, Multiple Exemplar Training (Auditory Input and Minimal Contrasts Therapy), and Homework. The therapy involves the child, primary caregiver(s) and therapist; and sometimes significant others, including older siblings, grandparents and teachers, become involved in homework.

## Parent education (Family education)

### Rationale

Recognising that PACT will not suit every child or every family, we hypothesised that arming interested parents with techniques (e.g., modelling, recasting, fostering repair strategies and providing alliterative input in thematic play contexts) related to their own child's intervention needs, and by working with them collaboratively, we would tap a unique and powerful 'therapeutic resource'. Unique because a child (usually) only has one set

of parents, and powerful because (usually) parents likely spend the most time with their child and are most motivated to help. Through supportive parent education, they would be guided to use 'speech time' optimally in homework and incidentally in real (not contrived) communicative contexts as natural opportunities arose. This might lead to the need for less consultation and fewer child-clinician contact hours, and ensure that planned breaks from therapy were used more productively.

## Methods

Incorporating simple principles of adult learning (Knowles, 1970), parents learn techniques, explained in plain-English (Bowen, 1998a, b), including: delivering modelling and recasting, encouraging self-monitoring and self-correction, using labelled praise and providing focused auditory input. Employing clinical judgement and responding to parent feedback, parent education is delivered according to need (Bowen & Cupples, 2004). It may happen in the form of modelling, counselling, direct instruction, observation, scripted routines, participation and discussion in assessment and therapy sessions, as well as role-playing, 'coaching' and rehearsal. For some families, this involves independent reading of handouts and publications (Bowen, 1998a, b; Flynn & Lancaster, 1996) and viewing informational slide shows that are e-mailed to them or accessed from [www.speech-language-therapy.com](http://www.speech-language-therapy.com), viewed on home computers, and later discussed. Some families need more support than this and are 'talked through' informational handouts and view individualised (for them and their child) slide shows in-clinic, explained carefully by the therapist.

Written information is provided in a speech book that often becomes a prized possession of the child's, particularly if it features his or her own artwork. It is used to facilitate communication between therapist, family and others involved (e.g., grandparents or teachers). It includes current targets and goals, a progress record, homework activities, developmental norms and information about intervention for SSD. Parents and

teachers are encouraged to contribute to the book: recording progress, commenting on homework content and performance, noting favourite activities or their own innovations and often giving important pointers to the therapist that might otherwise be unavailable. For instance, Bowen & Cupples (2004) reported that Sophie, 4;3, with a moderate-to-severe SSD, talked constantly at home and was animated and chatty in the clinic, but that her teacher surprised (and enlightened) the therapist and her parents when she wrote in the speech book: 'I enjoy working with Sophie and doing the activities in her book. She is very responsive in the one-on-one – loves it – but if I try to involve another child or two she clams up completely. I think you should know that she never speaks to her kindy peers – only to teachers and the aide, and only one-to-one, and in a quiet voice we can hardly hear'. The teacher's insightful note led to providing pre-school personnel with strategies that fostered Sophie's ability to communicate with her peers (see 'Adult Communicative Styles and Encouraging Reticent Children to Converse' at [www.speech-language-therapy.com](http://www.speech-language-therapy.com)).

## Discussion

Parents of the children in the efficacy study were not 'selected' in any sense and were not forewarned prior to initial consultation that they would be asked to participate in the therapy. Nonetheless, all the families rose to the task willingly, becoming actively involved in therapy sessions and in homework which they did in 5- to 7-minute bursts once, twice or three times daily, as recommended. On average, homework was done 24 times per week (4 families), 18 times per week (1 family), 12 times per week (7 families), 8 times per week (1 family) and 6 times per week (1 family) (Bowen, 2010; Bowen & Cupples, 2004).

Parents vary in the amount and style of information they need, some performing well with little explanation, learning best via observation and rehearsal. Others want a lot of 'training' before being comfortable performing activities at home. Although it is encouraged without insisting, some parents are shy when it comes to rehearsing

homework tasks in the clinic with the therapist watching. Educational levels appear to have little bearing on how readily parents comprehend and work with concepts, expressed in plain-English, such as 'sound patterns', 'sound classes', 'reinforcement', 'modelling', 'labelled praise', 'revisions and repairs', 'progressive approximations', 'shaping' and 'gradualness of acquisition'. Subjectively, it seems some parents have an instinct, 'feel', or 'gene' for this sort of thing, and some appear to have missed out! Some are intuitive 'natural teachers', and some are not. Despite this, it is amazing what parents will *learn* to do well with adequate levels of support when they perceive that their child stands to benefit. Parents with personal histories of communication difficulties similar to their child's may be endowed with a special empathy, although some of them may have residual issues affecting their capacity to reflect on language function and to enjoy language play (Crystal, 1996, 1998).

In delivering parent education, it is imperative to

- avoid overwhelming families with information at any point;
- circumvent giving them the impression that they have to become 'mini-therapists';
- provide parents with opportunities to rehearse new skills if appropriate, while being sensitive that some adults find it embarrassing and difficult (or culturally inappropriate) to play (Watts Pappas & Bowen, 2007);
- create an atmosphere in which parents can feel comfortable in questioning anything not understood, share their perspectives, and exercise choice; and
- listen to their ideas respectfully and incorporate them where possible.

## Metalinguistic training

### Rationale

This component was inspired by a fascinating article by Dean and Howell (1986) that proposed a role for guided discussion and meta-language in

helping children reflect on the features or properties of phonemes, and the structure of syllables, with a view to improving their awareness of when and how to apply phonological repair strategies. Dean, Howell and colleagues went on to develop *Metaphon*, described in Chapter 4, an approach that centres on dialogue between therapist and child with only passing references to parents. We wanted to take these ideas in a new direction, actively engaging parents, still with the aim of increasing children's metaphonological awareness, and their capacity to reflect on their own speech performance.

Excited by the practical connections between Ingram's (1976) schema of underlying representation, surface form and mapping rules, and the Dean and Howell (1986) suggestions for developing linguistic awareness, it struck us that, if they were only implemented for a short period in weekly therapy sessions, their effects might not be optimal. Our plan was to provide parents with training, scripts and informational handouts (later to become Bowen, 1998a, and in French, Bowen, 2007). We reasoned that if *child*, and *clinician* and *parents*, and *teachers* where applicable, used a common language around sound and syllable properties, and the reasons for, and the communicative consequences of homophony, it would improve the accuracy of that child's knowledge of the system of phonemic contrasts and increase the likelihood of spontaneous self-corrections. This would be especially the case if *all* the adults involved (not just the SLP/SLT) knew how to reinforce them. Metalinguistic training fosters 'phonological discoveries' by the child. His or her capacity to *perceive*, *talk about*, *reflect upon* and *revise and repair* homophonous productions is enhanced via simple routines and systematic feedback delivered by parents.

## Methods

Using guided discussion (Dean & Howell, 1986), child, parents and clinician talk and think about the properties of the speech sound system and how it is organised to convey meaning, incorporating simple metaphonological and phonological






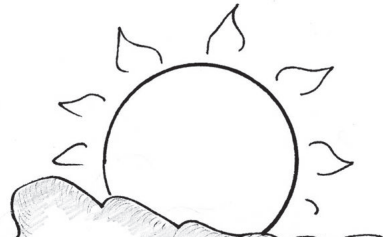
awareness (Hesketh, A28) activities. In finding a common language to describe phonemic features and syllable shapes, the clinician can borrow from many sources, including Klein's (1996a, b) 'imagery terms' or 'imagery labels' (e.g., poppy, windy, throatie and tippy, discussed in Chapter 4); the *Metaphon* (Dean et al., 1990) terms such as long, short, front, back, noisy, growly, whisper and quiet; and the imagery names and cues in Table 6.5.

Activities, at home and in therapy, involve sound picture associations (e.g., /ɹ/ is a roaring lion sound; /tʃ/ is a choo-choo train; /f/ is a bunny rabbit sound, because it is made with teeth like a bunny); phoneme segmentation for onset matching (e.g., kangaroo starts with /kə/, or for preference, /k/); awareness of rhymes and sound patterns (e.g., games with minimal pairs like *tie-die*; and near minimal pairs like *tie-tight*); rudimentary knowledge of the concept of 'word'; understanding the idea of words and longer utterances 'making sense'; awareness of the use of revision and repair strategies using 'judgement of correctness' games (e.g., *The boy tore his shirt* vs. *The boy tore his cert*) and the 'fixed-up-one routine'; and playing with morphophonological structures to produce lexical and grammatical innovations (e.g., *pick* vs. *picks*).

The use of spontaneous revisions and repairs is fostered, particularly at home, by use of the fixed-up-one routine. The routine is a metalinguistic technique that allows adults to talk simply to children about revisions and repairs (or self-corrections). Scripts, such as the one displayed in Figure 9.4, are provided to introduce them to the technique, and various versions of it are available, with an instructional slide show at [www.speech-language-therapy.com](http://www.speech-language-therapy.com). Also with regard to self-monitoring and making revisions and repairs, the child is encouraged to *notice* phoneme collapses or homonymy (e.g., *boo* and *blue* realised homophonously as /bu/).

## Discussion

The 1986 suggestions of Dean and Howell were adopted and extended, allowing metalinguistic

<p style="text-align: center;"><b>seal</b></p> 	<p style="text-align: center;"><b>soap</b></p> 
<p>1. Say to your child, "Listen. If I said 'heel', it wouldn't sound right. I would have to fix it up and say 'seal'".</p>	<p>2. Say to your child, "'Hope' isn't right, is it? I need to do a fixed-up-one and say 'soap'".</p>
<p style="text-align: center;"><b>soup</b></p> 	<p style="text-align: center;"><b>sand</b></p> 
<p>3. "Would I have to do a fixed-up-one if I said 'hoop' for this one?"</p>	<p>4. "What would I have to do if I accidentally said 'hand' for this one? I would have to do a ... [fixed-up-one]"</p>
<p style="text-align: center;"><b>sauce</b></p> 	<p style="text-align: center;"><b>sun</b></p> 
<p>5. "If I said 'horse' instead of 'sauce' I would have to do a fixed-up-one again. I would have to think to myself not 'horse' it's 'sauce'. Did you hear that fixed-up-one?"</p>	<p>6. "Would I have to do a fixed-up-one if I said 'hun' for this one?"</p>

**Self-corrections**  
 Adults continually make little mistakes when they speak. They barely notice these mistakes at a conscious level, and quickly correct themselves, and go on with what they are saying. This process of noticing speech mistakes and correcting them as we go is called making revisions and repairs, or self-corrections. Many children with speech sound difficulties are not very good at self-correcting. They find it difficult to monitor their speech (i.e., listen to it critically) and make corrections.

**Fixed-up-ones**  
 At home this week, introduce the idea of a "fixed-up-one", or the process of noticing speech mistakes and then saying the word(s) again more clearly, specifically in relation to the consonants at the beginnings of the six words featured on this page. Go through the following routine two or three times, and talk about fixed-up-ones. Have some fun making up other "mistakes" with words, that need correcting.

**Figure 9.4** An example of a fixed-up-one routing. Drawing by Helen Rippon, Speech and Language Therapist: [www.blacksheepress.co.uk](http://www.blacksheepress.co.uk).



awareness to be targeted in naturalistic, supportive clinic *and home* settings. Expressions that crop up constantly in the context of PACT being discussed with parents are ‘talking task’, ‘listening task’, ‘thinking task’, ‘fixed-up-ones’, ‘word’, ‘rhyme’, ‘making sense’, ‘make the words sound different from each other’, ‘two-step word’ and ‘remember the 50:50 split’. The latter refers to the general recommendation that the 50:50 split between ‘talking tasks’ versus ‘thinking and listening tasks’ that is observed in therapy sessions is also observed at home.

Sometimes a family will generate its own appropriate terminology, and memorable offerings have included ‘Bob’, ‘Bobs’ and ‘fix-its’ in relation to ‘fixed-up-ones’ (Bob the Builder’s motto is ‘Can we fix it? Yes we can’) and ‘Einstein Time’ in relation to listening and thinking tasks! ‘Einstein Time’ and ‘Nice one, Einstein!’ were the brainchild of Sebastian’s father, who was intrigued by my framed picture of Einstein, adorned with a thinks bubble that read ‘THINKING’. The picture is sometimes put on the table during ‘thinking tasks’, such as judgement of correctness games, silent sorting of word-pairs, ‘point to the one I say’ activities, and word classification games, to cue everyone that (quiet) ‘thinking’ is supposed to be happening! Readers who would like to experiment with this idea can download Einstein pictures from [www.speech-language-therapy.com](http://www.speech-language-therapy.com).

## Phonetic production training

### Rationale

‘Phonological disorders arise more in the mind than in the mouth’, according to Grunwell (1987), and phonological therapy is, by definition, linguistic, meaning-based, focused on activating a child’s underlying system for phoneme use, and ‘in the mind’. But, having said that, some children with phonological disorder need help at the phonemic level *and* the perceptual and phonetic levels. In other words, they must be taught to perceive (discriminate) sounds, and make the sounds and structures.

## Methods

Phonetic production training is integrated with metalinguistic training and multiple exemplar training. It uses, as required, auditory discrimination activities, stimulability techniques (Bleile, 2004, 2013; Miccio, 2005) and sound elicitation and phonemic placement procedures (Secord, Boyce, Donohue, Fox & Shine, 2007) wherein the therapist teaches a child to perceive and generate absent phones *beyond* isolated sound level, or failing that, to produce approximations of consonants in the same sound class in CV (onset) and VC (coda) combinations. Homework for phonetic targets includes listening and production, observing the 50:50 split.

## Discussion

It is rarely necessary to train intervocalic (SIWW or SFWW) stimulability or to train all vowel and diphthong contexts. For instance, having taught /tʃu/ and /utʃ/, one seldom has to teach /tʃu tʃi tʃə tʃa tʃou tʃei tʃa/ and /utʃ itʃ ətʃ aɪtʃ outʃ eɪtʃ atʃ/, etc. Children usually proceed from syllable to word level, having demonstrated the capacity to produce the phone in CV and/or VC contexts. Introductory stimulability or pre-practice tasks may be at individual sound (segment) and ‘nonsense syllable’ level, even involving ‘syllable drill’, but not for long. Once a child is stimutable for a target, or is producing a passable approximation, or a phone in the same sound class, in syllables or words, therapy moves onto the phonemic level and all activities are ‘meaning-based’ at word level and beyond (Bowen & Cupples, 2006). The child does production practice of a few target words, usually no more than six. It is important to know that ‘phonetic production training’ does not imply traditional articulation therapy (Van Riper, 1978) or adaptations of it (e.g., Raz, A4).

## Multiple exemplar training

### Rationale

Focused auditory input and the heightened perceptual saliency of phones, structures and contrasts,

provided by the therapy activities, increases the learnability of new sounds, syllable structures and word contrasts.

## Methods

Multiple exemplar training has two overlapping aspects: auditory input and minimal contrast (minimal pair) therapy. Auditory input involves listening lists, alliterative input and thematic play; and minimal contrast therapy uses minimal, maximal or multiple oppositions between words. Listening lists comprise word lists of up to 15 words with a common phonetic feature (e.g., *sail, seat, sigh, sew, seed, sum, sack, sun, sand, sea, sock, soup, silly, seal, saw, soap*) or up to seven word pairs (e.g., *sock-shock, sour-shower; sack-shack, sip-ship, sell-shell, Sue-shoe, save-shave*) or triplets (e.g., *seat-sheet-cheat, sigh-shy-chai, sip-ship-chip, sore-shore-chore, Sue-shoe-chew*) or target, error, and 'foil' (e.g., *pie-bye-boo, pig-big-boo, Paul-ball-boo, pin-bin-boo, pug-bug-boo, pat-bat-boo, poi-boy-boo*) to the child. Foils are introduced to make some sequences more rhythmical and fun, and more enticing for the child to dance, jog, march, rap or bop to. Sometimes the words are pictured and sometimes not. Alliterative input can be provided via stories, songs, rhymes, games and worksheets, such as one for /k/ SIWI depicting a *cat*: in a *cupboard*, with a *kite*, in a *coat*, in a *corner*, in a *kennel*, being *carried*, behind a *curtain* and in a *cap*.

Thematic play or auditory input therapy (Lancaster, A24) involves playing games and reading books to the child that give rise to frequent repetitions of targets. Bowen (2010) describes an activity for 'Bruno', 4;2, who was learning /f/ SFWF. In one therapy session, and for a week in homework, he listened to the story of Jeff and Steph and the scarf (shown in Figure 6.3). In related homework, Bruno played minimal contrast games using the work sheet illustrated in Figure 9.5. At intervals, outside of formal homework, Bruno played a game with his father where a superhero jumped off a roof, and he played with Smurf figurines with both parents. In fact, he took the Smurfs almost everywhere, constantly

pretending to be a Smurf; and, for a period, Smurfs became his main conversational topic (briefly supplanting Thomas the Tank Engine)—exactly what was needed to provide intense and interesting (to him) input for final /f/.

In minimal contrast therapy, a child sorts, with as much help as is required, words pictured and captioned on cards according to their sound properties, in sessions and for homework, and engages in homophony confrontation tasks (in sessions but not for homework), such as the ones below. With activities 6, 7 and 8, it is important to explain clearly to parents that the child does not have to 'correct you'. All the child is required to do is to judge the correctness of the adult's production.

### 1. 'Point to the one I say'.

The child points to pictures of the words, spoken by the adult in random order (e.g., *sheet, sip, sell, ship, shell, seat*) or rhyming order (e.g., *seat-sheet, sip-ship, sell-shell*).

### 2. 'Put the rhyming words with these words'.

Three to nine cards are presented (e.g., *pin, pea, pack, pole*), and the child puts rhyming cards beside them (*bin, bee, back, bowl*).

### 3. 'Say the word that rhymes with the one I say'.

The adult says words with the target phoneme; the child says rhyming non-target words (adult: *floor*; child: *four*; adult: *flake*; child: *fake*), with the child saying carefully selected words that he or she can already say.


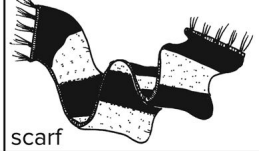



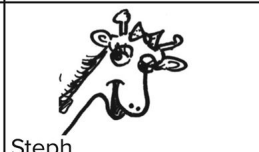

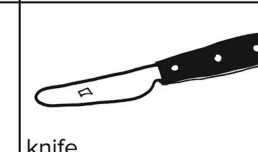
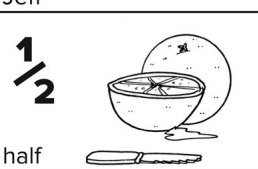
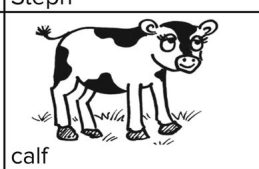
### 4. 'Give me the word that rhymes with the one I say'.

The adult says the non-target word, and the child selects the rhyming word containing the target sound. For example, in working on velar fronting: Adult says 'tea'; Child selects a picture of 'key'. Adult says 'tool'; Child selects a picture of 'cool'. Adult says 'tape'; Child selects a picture of 'cape'.











### 5. 'Tell me the one to give you'.

This is a homophony confrontation game, and it is the only task that it not included in homework. It needs a skilled, light touch and can easily go wrong, especially if the child








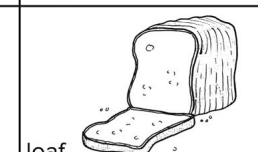

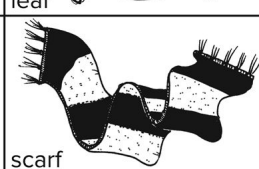
### Rhyming Pairs /f/ SFWF

 laugh	 scarf	 off	 cough
 Jeff	 Steph	 wife	 knife
 half	 calf	laugh scarf off cough Jeff Steph wife knife calf half	
		scarf laugh cough off Steph Jeff knife wife half calf	

### /f/ vs. /p/ SFWF

 cough	 cop	 Steph	 step
 wife	 wipe	 cuff	 cup
 sniff	 snip	cough cop Steph step wife wipe cuff cup sniff snip	
		cop cough step Steph wipe wife cup cuff snip sniff	

### Final /f/ vs. no final consonant

 la	 laugh	 Y	 wife
 Lee	 leaf	 low	 loaf
 scarf	 scarf	la laugh Y wife Lee leaf low loaf scarf scarf	
		laugh la wife Y leaf Lee loaf low scarf scarf	

**Figure 9.5** Minimal pair and near minimal pair sets. Drawing by Helen Rippon, Speech and Language Therapist, [www.blacksheepress.co.uk](http://www.blacksheepress.co.uk).

is pushed too hard. In a game context, the adult responds to the word actually said (e.g., the child says [tɪn] for 'chin' and is handed 'tin'). The aim is for the child to recognise communicative failure (i.e., recognise his or her own homophony) and attempt a revised production.

6. **'You be the teacher: tell me if I say these words the right way or the wrong way'.**

The adult says individual words or phrases, and the child judges whether they have been said correctly; for example, *puddy tat* versus 'pussy cat'. The child judges: right/wrong; yes/no; OK/silly. The child does not 'correct' the adult.

7. **'Silly sentences'**

The child judges whether or not a sentence is a 'silly one'; for example, One-two buckle my doo versus One-two buckle my shoe; Mary had a little lamb versus Mary had a whittle wham. The order of presentation of the correct and incorrect sentence is varied. The child does not 'correct' the adult.

8. **'Silly dinners'**

The adult says what he or she wants for dinner, and the child judges whether it is a 'silly dinner': I want jelly/deli; I want fish and chips/ships; I want green peas/bees; I want a cup of coffee/toffee. The child does not 'correct' the adult.

9. **'Shake-ups and match-ups'**

The child is shown four pictures, for example, tie-time, two-toot. The pairs are said to the child rhythmically several times. Cards are 'shaken up' in a container and tipped out. The child then arranges them, with help if necessary, 'the same as they were before' (i.e., in near minimal pairs).

10. **'Find the two-step words'.**

With adult assistance, the child sorts pictured near minimal pair words with consonant clusters SIWI or SFWF from contrasting words with singleton consonants SIWI or SFWF (e.g., feet-fleet, fat-flat, fake-flake).

11. **'Walk when you hear the 2-steps'.**

Child 'finger-walks' two steps (to a destination such as a pot of gold, or to a place on

a treasure map; or up a ladder) upon hearing a consonant cluster SIWI as opposed to a singleton SIWI (e.g., the child 'walks' for 'true', but not 'two' or 'roo').

## Discussion

Suggestions for multiple exemplar activities 1–11 above are provided to parents. It should be noted, however, that, for many families, the suggestions trigger their creativity and they come up with innovative and appropriate games, activities and books that are perfect for their child (and inspiring for the clinician).

## Homework

### Rationale

Homework administered by a parent or parents provides children with practice, reinforcement, opportunities to generalise and opportunities for discovery. It allows families to hone, generalise and enjoy the 'teaching skills' learned in therapy sessions. By engaging in activities autonomously, families can experiment, creating new opportunities for learning in natural, functional contexts. As their knowledge, skills and confidence grow, most will innovate, making up new games and fun routines, and some even instigate apposite 'next steps' in therapy. They also become more skilled in recognising 'teaching moments' weaving them seamlessly into the child's day so that they do not feel they are 'doing speech homework all the time'. Because homework suggestions are not rigid, homework is conducive to internal development and families can shape it to fit their interests, preferences and culture. Homework can assume the family 'stamp' as well as the clinician's 'style', influencing the form, content and conduct of sessions in dynamic and striking ways, letting the adults create activities a child genuinely likes and is responsive to.

### Methods

Homework involves short bursts of formal home activities and the use of appropriate speech



stimulation techniques (e.g., modelling corrections) when opportune. Homework comprises activities from the most recent session, delivered in 5- to 7-minute bursts once, twice, or three times daily, one-to-one with an adult in good listening conditions. Examples of 'good' and 'poor' listening conditions are discussed. Practices can be as little as 10 minutes apart (e.g., practice-craft-practice-craft-practice-craft for children who like making things; or for booklovers, practice-story-practice-story-practice-story; or practices can be alternated with playing a game: practice-game-practice-game-practice-game, or completing a puzzle: practice-puzzle-practice-puzzle-practice-puzzle), with the 50:50 split observed between listening-thinking tasks versus talking tasks. Parents are encouraged to make the homework regular, brief, naturalistic, encouraging and fun. Instructions and activities go in a homework book and are explained as often as required. If, for some reason, homework does not happen for a day or days, parents are asked not to 'compensate' by doing more than three practices in one day subsequently. It is suggested that they combine homework with activities the child likes, such as colouring and cutting, story reading or going to a park or favourite spot sometimes to do it.

## Discussion

If one family member (e.g., his father in Iain's case) usually accompanies the child and participates in therapy sessions, other family members (e.g., mother and grandparents) can learn from their example during homework sessions and by watching their application of modelling, recasting and other techniques. The system will fall down if one parent does 'the bringing' to therapy and the other parent does *only* the formal homework without good communication between the two, as sometimes happens.

Younger children generally like the idea of doing 'homework' as something 'big kids' do. For some parents and older children, however, there may be interfering negative connotations and emotional baggage. In this connection, a colleague in the United States offered interesting

comments on the term 'homework' which gave me pause for thought: 'I use the term 'home programming' instead of 'homework'. For me homework is something that kids might hate doing, or it may be something that children are meant to complete individually. Home programming reflects effort on the parents' part, and may not get the same negative response that 'homework' can sometimes get. It could also be called 'speech work' or such. It is just a preference based on my experience in providing after school services and working with parents. Many of my colleagues, I'm sure, use 'homework' (Mark Guiberson, personal correspondence, 2014).

## Case study

### Background

Josie attended a rural New South Wales Community Health Speech Pathology clinic with her mother six times between the ages of 5;2 and 5;5 for an assessment and five 'language stimulation group' sessions conducted by a locum SLP because she was a late talker and her speech was unintelligible. At 5;11, she was referred back to Community Health by a school nurse, attending an intake clinic with her father, David, for a speech assessment only. In a 20-minute session, an 88-word, 3-position screener called the *Articulation Survey* (Fisher & Atkin, 1996) was administered by a second SLP who diagnosed developmental verbal dyspraxia (DVD) and added Josie to a therapy waiting list. She had normal audiograms at 6;1 and 6;7.

### Referral

A District School Counsellor (Educational Psychologist) referred Josie to me 6 months after the DVD diagnosis was made. The referral was prompted by Josie's teacher, concerned about her language development, disinterest in and difficulty with pre-reading and phonological awareness activities, and her air of unhappiness at school.



## Initial presentation

Bright, bubbly and co-operative, Josie, 6;5, presented for initial consultation towards the end of her first year of school (Kindergarten in NSW). The first session involved history taking and administering a CELF-P requested by school personnel. Josie performed in the mid-average range: receptive, expressive and total language scores 103, 100 and 101, respectively. Apart from late language acquisition, poor intelligibility, and a maternal family history of speech and literacy difficulties, Josie's history was unremarkable. The conversational speech sample excerpt and the *Quick Screener* data displayed in Figures 9.6 and 9.7, respectively, were gathered at 6;6 in the second session (4 weeks after the first), and the analysis displayed in Figure 9.8 was done while her parents watched. At 6;6, her mother, Maureen, and half-sister Emma assigned Josie an intelligibility rating of (2) mostly intelligible (to them both). I gave her (3) somewhat intelligible to me; and David and Josie's teacher gave her ratings of (4) mostly unintelligible (to them both).

## Screening process

Steps 1–4 were performed during the session, and Steps 5–10 were performed after it.

### Single-Word sample

1. The first step in this quick screening analysis was to examine the SW sample (Figure 9.7), tally Josie's consonants correct out of approximately 100 (depending on the dialect of English), and calculate a tentative Percentage of Consonants Correct (PCC; tentative because this is a small, slightly inexact, SW *screening* sample). With scoring erring on the generous side, her SW PCC was 30%. Later it was found that both her conversational and imitated PCCs were lower than this at 27%, indicating an unusually severe SSD for a child of 6;6.
2. Using the analysis form (Figure 9.8), phonological processes with their percentages of

occurrence and other obvious errors were noted as follows: velar fronting 25% SI and SF; prevocalic voicing 57%; gliding of liquids 100%; final consonant deletion 66%; stopping of fricatives 25% SI; stopping of affricates 100% SF; and cluster reduction 100% SI and SF. Gliding of fricatives and affricates SI was prevalent, as was deletion of fricatives WF, glottal replacement, and /n/ dentalised, interdental, or produced /n<sup>d</sup>/.

3. Counting each vowel and diphthong as one vowel, her vowels correct out of 47 were tallied and a tentative PVC calculated. With vowel errors in 12 words (*fish, kiss, bridge, wing, leaf, foot, van, crab, splash, house, stairs, and ear*), her PVC was about 74% (35/47). Her productions of *girl* and *salt* were not factored in because they were dialectal.

### Single-word and conversational speech sample

4. Referring to the SW and CS sample, the vowels and consonants present were listed to record Josie's vowel and consonant inventories.
5. The marked consonants present in her SW and CS samples were circled on the form. Her marked consonants were /p t k f θ/, with /v/ and /ʃ/ considered marginal because they occurred infrequently and neither were present in both samples.
6. Any vowel and/or consonant inventory constraints were noted. Her SW consonant constraints (missing consonants) were /ŋ ð s z tʃ ɕ l/, and her CS constraints were /ŋv ð s z ʒ tʃ ɕ l ɹ/. There were no vowel inventory constraints, and one missing diphthong /ɪə/.
7. Phonotactic combinations were recorded to assess Josie's syllable/word shape inventory. She only produced one- and two-syllable combinations, and her inventory was C, V, CV, VC, CVC, CCV, CCVC, CCCV, CVCV, CCVCCV and CCVCVC.
8. Idiosyncratic or unusual features were noted. They were dentalised alveolars, glottal replacement, gliding of fricatives and

- Josie:** e : ə j ʌ n̩<sup>d</sup> ʌ n̩<sup>d</sup> m u n ɒ u n w ʌ n̩<sup>d</sup> d aɪ d  
There's a sun and moon on one side
- ʌ n̩<sup>d</sup> θ ə d aɪ ɒ n̩<sup>d</sup> θ i ʌ d ə d aɪ d wɪ ? ə b w eɪ n d oʊ ||  
and the sky on the other side with a rainbow.
- θ ə h æʊ d ɔ ɪ d b w a k ʌ m ɒ ?  
The handle is broken off,
- d oʊ j ʌ k i j ɔ p<sup>h</sup> ʌ n̩<sup>d</sup> ɪ n ɪ t d ɔ n̩<sup>d</sup> j ʌ ||  
so you keep your pens in it, don't you?
- w e : dɪ d θ ʌ ? k<sup>h</sup> ʌ k ʌ m θ ɒ u m e : b w ə ||  
Where did the cup come from, ever?
- Caroline:** My friend Anna gave it to me.
- Josie:** w ə d ɪ ? j ɔ b ɜ θ d eɪ ||  
Was it your birthday?
- Caroline:** No, it was just for a present.
- Josie:** w e : j u d a ? w e n θ ə h æ j u p<sup>h</sup> ʌ w ɒ ? ||  
Were you sad when the handle fell off?
- Caroline:** Actually, it didn't have a handle when she gave it to me.
- Josie:** j ɔ b ʌ n̩<sup>d</sup> g eɪ j u ə k<sup>h</sup> ʌ wɪ ? n oʊ h æʊ d ɔ ||  
Your friend gave you a cup with no handle.
- aɪ m i n j aɪ h æ j oʊ ||  
I mean, like hello!
- ʃ i w ə d ? ə b w i g u<sup>d</sup> j u d ə ||  
She wasn't a very good chooser.
- Caroline:** Do you like it?
- Josie:** j e t ɪ t<sup>d</sup> w e : d i b w ə d i ||  
Yes. It's really pretty.
- Caroline:** I like it too, even though it has no handle.
- Josie:** b ʌ ? ɪ ? w ə b i b e t ə wɪ ? ə h æʊ d oʊ ||  
But it would be better with a handle.

**Figure 9.6** An excerpt from Josie's conversational speech sample at 6;6

#	TARGET	TRANSCRIPTION	CC	#	TARGET	TRANSCRIPTION	CC	
1	cup	ʌ k <sup>h</sup> ʌ	1	23	jam	æ jiæm	1	
2	gone	ɒ k <sup>h</sup> ɒn	1	24	<u>house</u>	aʊ hæʊ	1	
3	knife	aɪ naɪ	1	25	path	a p <sup>h</sup> a	1	
4	sharp	a wja:		26	door	ɔ dɔ	1	
5	<u>fish</u>	ɪ de		27	smoke	ou mou	1	
6	<u>kiss</u>	ɪ de		28	<u>bridge</u>	ɪ mweʔ		
7	sock	ɒ wj:ɔk	1	29	train	eɪ ɹeɪ n	2	
8	glass	a wja		30	chair	ɛə jɛə		
9	watch	ɒ bwɔʔ	1	31	red	e wje:		
10	nose	ou nou	1	32	spoon	u bun	1	
11	mouth	au mau	1	33	plane	eɪ veɪ		
12	yawn	ɔ j ɔ n	2	34	fly	aɪ fnaɪ		
13	<u>leaf</u>	i wjeɪ		35	sky	aɪ fnaɪ		
14	thumb	ʌ θʌ <sub>n</sub> <sup>d</sup>	1	36	sun	ʌ jʌ <sub>n</sub> <sup>d</sup>	1	
15	<u>foot</u>	ʊ b ɒ ʔ		37	<u>wing</u>	ɪ weɪ n	1	
16	toe	ou t <sup>h</sup> ou	1	38	<u>splash</u>	æ bwʌʃ	1	
17	snake	eɪ fneɪʔ	1	39	tent	e denʔt	2	
18	<u>van</u>	æ bweɪn	1	40	salt	ɒ j ɒʊt	1	
19	fast	a b <sup>h</sup> a		41	<u>crab</u>	æ mbwa		
20	girl	ɜ gwɜʊ	1	42	sweet	i bwiʔ	1	
21	<u>stairs</u>	eə d <sup>h</sup> e		43	sleeve	i bwiʔ		
22	big	ɪ bɪ	1	44	zipper	ɪ wɪbə		
boy bɔɪ <u>ear</u> ɪə			SUBTOTAL CC:		15	TOTAL CC:		30

**Figure 9.7** Josie's initial Quick Screener data at 6;6

affricates, vowel and diphthong errors, schwa insertion, final consonant deletion and no words beyond two syllables in the CS sample.

- The data were perused for chronological mismatch, and one example was found in her correct production of /θ/ as in 'birthday' in all obligatory contexts.
- The syllable stress inventory (assuming typical stress patterns) was recorded as S = strong

and W = weak. The SW words she produced in the CS excerpt were representative of the entire CS sample (*zipper*, *better*, *other*, *handle*, *birthday*, *rainbow*, *broken*, *chooser*, *really*, and *pretty*). There were no other word stress patterns apart from one WS in 'hello' when mimicking Emma's 'cool' production with strong emphasis on the second syllable. Note that Josie spoke a non-rhotic variety of Australian English: AusE (Cox, 2012).

<b>Velar fronting 25% SI 25% SF</b>						<b>Pre-vocalic voicing 57%</b>					
#	Target SI	0 / 1	#	Target SF	0 / 1	#	Target	0 / 1	#	Target	0 / 1
1	cup	0	7	sock	0	25	path	0	5	fish	1
6	kiss	1	17	snake	0	16	toe	0	14	thumb	0
2	gone	0	22	big	0	6	kiss	1	36	sun	1
20	girl	0	37	wing	1				4	sharp	1
	TOTAL	1/4		TOTAL	1/4					TOTAL	4/7
<b>Palato-alveolar fronting</b>						<b>Liquid/glide simplification gliding 100%</b>					
#	Target SI	0 / 1	#	Target SF	0 / 1	#	Target	0 / 1	#	Target	0 / 1
4	sharp	0	5	fish	0	9	watch	0	12	yawn	0
30	chair	0	9	watch	0	13	leaf	1	31	red	1
23	jam	0	28	bridge	0					TOTAL	/4
	TOTAL	/3		TOTAL	/3						
<b>Word-final devoicing</b>						<b>Initial consonant deletion</b>					
#	Target	0 / 1	#	Target	0 / 1	#	Target	0 / 1	#	Target	0 / 1
41	crab	0	43	sleeve	0	3	knife	0	7	sock	0
31	red	0	10	nose	0	22	big	0	30	chair	0
22	big	0	28	bridge	0	18	van	0	12	yawn	0
				TOTAL	/6					TOTAL	/6
<b>Backing</b>						<b>Final consonant deletion 66%</b>					
#	Target SI	0 / 1	#	Target SF	0 / 1	#	Target SI	0 / 1	#	Target SF	0 / 1
16	toe	0	15	foot	0	23	jam	0	10	nose	1
39	tent	0	42	sweet	0	44	zip	0	5	fish	1
26	door	0	31	red	0	31	red	1	28	bridge	1
	TOTAL	/3		TOTAL	/3					TOTAL	4/6
<b>Stopping of fricative 25% SI</b>						<b>Initial cluster reduction 100% SI</b>					
#	Target SI	0 / 1	#	Target SF	0 / 1	#	Target SI	0 / 1	#	Target SI	0 / 1
5	fish	0	13	leaf	0	33	plane	1	43	sleeve	1
15	foot	1	11	mouth	0	8	glass	1	27	smoke	1
14	thumb	0	6	kiss	0	28	bridge	1	17	snake	1
7	sock	0	38	splash	0	29	train	1	32	spoon	1
36	sun	0	43	sleeve	0	41	crab	1	21	stairs	1
4	sharp	0	10	nose	0	34	fly	1	35	sky	1
18	van	1				42	sweet	1	38	splash	1
44	zip(per)	0								TOTAL	14/14
	TOTAL	2/8		TOTAL	/6						
<b>Stopping of affricates 100% SF</b>						<b>Final cluster reduction 100%</b>					
#	Target SI	0 / 1	#	Target SF	0 / 1	#	Target	0 / 1	#	Target	0 / 1
30	chair	0	9	watch	1	19	fast	1	40	salt	1
23	jam	0	28	bridge	1	39	tent	1			
	TOTAL	/2		TOTAL	2/2					TOTAL	3/3

Figure 9.8 Josie's initial Quick Screener analysis at 6;6

11. Extensive homonymy was evident (e.g., *where*, *were*, and *red* were produced identically).
12. Her contrastive phones (phonemes) were /n m w j p b t d/, and it was interesting to see that /n m w j p b d/ were in the Early 8 and /t/ was in the Middle 8 with no Late 8 consonants functioning as phonemes. Her non-contrastive phones were /h g k f ɹ ʃ θ/.
13. Subsequent administration of the Locke Task showed that she could not reliably discriminate between the liquid /l/ from either the glide /j/ or the liquid /ɹ/.
14. Subsequent administration of the DEAP inconsistency assessment revealed predominantly *consistent* production, with only two items, *helicopter* and *vacuum cleaner*, produced inconsistently.

From this screening (1–12 above) and her performance during language testing 1 month before, it was evident that Josie had a severe phonological disorder with phonemic, perceptual and phonetic issues, and CAS was ruled out. Parental permission was obtained to share these data, including videos of therapy, for research, teaching and publication purposes. Permission to show the videos was later withdrawn.

### Josie's family

The family were eager to be involved in therapy, especially if it meant the number of sessions could be reduced. They were drought affected and on a tight budget, residing 100 km (62 miles) over difficult terrain from my practice. Josie's household comprised her father (David, 52); mother (Maureen, 38); half-sister (Emma, 15), who was home-schooled by Maureen and David and who was Maureen's child; and Josie's twin brother and sister (Jasper and Ruby, 4;2). David had two sons (Ben, 16, and Aaron, 14) living overseas with their mother (Rebekah, 54). Maureen was not in paid employment, and David sent regular child support payments and school fees to Rebekah. The family was cheerful and close-knit, spending much time together and with a wide circle of friends, espe-

cially around sport, local government, community and outdoor activities. Emma assumed a 'mothering' role with Josie, Jasper and Ruby. David volunteered that he was 'Type A', 'a news junkie', and 'obsessed with finances and the price of petrol'. No one disagreed.

There was a maternal family history of speech and literacy issues, and Maureen and Emma (described as 'learning disabled' by the school psychologist who referred Josie) were poor readers and spellers. Note that in Australia the term 'learning disability' means 'specific learning difficulty' or 'specific learning disability' and not 'intellectual disability', indicating intelligence in the normal range with a difficulty in some aspect of learning such as reading. Ruby was a late talker, unintelligible at 4;2, and waiting for SLP assessment at Community Health. Ben, Aaron and Jasper were reported to have 'excellent communication skills' (like David). Maureen was a calm, competent person who had completed 4 years of high school, 2 years of a hairdressing apprenticeship and a Child Care Certificate at an NSW Technical and Further Education Commission, known as TAFE NSW, college. She was employed as a pre-school assistant prior to Josie's birth. She did not drive a car due to her epilepsy. David had a law degree and a master's degree in business and was engaged in a new venture as proprietor of a specialist book publishing company, working from home on the family farm.

### Therapy planning for Josie

Although (marked) /ʃ/ appeared in Josie's CS output, she was not stimulable for it in the true sense. The (marked) affricates /tʃ/ and /dʒ/ and the (marked) fricatives /s/ and /z/ were never present in output and were also non-stimulable; so consonant inventory expansion was a priority. First, /tʃ/ was selected for stimulability training. The reasoning behind this was that there is evidence to suggest that targeting the marked voiceless affricate might: (1) evoke the emergence of *unmarked* consonants, and (2) promote generalisation to the voiced cognate, /dʒ/. A second marked consonant, /s/, was



selected for stimulability training because it might help promote cluster development and generalise to /z/ and other fricatives. Consideration was given to targeting the later developing and marked /ð/, but this idea was rejected. Because Josie already had its voiceless cognate /θ/ in her repertoire, it was felt that working on /ð/ might not have as much impact on her overall system as working on /s/. On the other hand, late-developing, non-stimulable, unmarked /l/ looked like a good candidate for intervention, especially since the Locke Task revealed that Josie could not reliably discriminate /l/ from /j/. In hindsight, it *might* have been more fruitful to target /ɹ/ early on. Thinking about /l/ led naturally to deciding about her clusters. Clearly, with 100% cluster reduction in her SW sample, and only /bw/ SIWI in her CS sample, clusters were a high priority. It was decided that targeting /l/ clusters was not the best option for her. Rather, targeting the adjuncts /st/, /sp/ and /sk/, although it might not stimulate generalisation to other clusters, might give her the 'idea' of producing clusters. In hindsight, this was *not* the smartest move, and /l/ clusters might have been the better targets.

### Agent, scheduling and dosage

Because of family finances and the high cost of petrol, it was decided to spread the therapy as much as was practical, with David eagerly committing to being 'very hands on'. David and Maureen were 'stuck' when it came to choosing an SLP for their daughter. They had virtually no choice with the closest SLP almost 2 hours' drive away over unsealed and mountain roads, entailing heavy petrol consumption over the round trip. They certainly did not have the luxury of questioning whether the author would be the 'best' therapist for them, whether they wanted to 'go privately', or whether the assessment administered would lead to service delivery that would fit easily with their busy family life. They did, however, consider whether the intervention offered was 'scientific' and whether the therapist was properly

credentialed and experienced, with David asking searching questions.

Their main consideration in proceeding was to minimise and 'budget' the number of appointments. In the event, Josie was seen 15 times over 12.5 face-to-face hours, spread over almost 12 months, with the support of a homework program conscientiously administered by her parents and teenage sister, Emma.

The dosage and scheduling described for Josie was mainly the result of her parents' wishes, influenced by my suggestions on how appointments could be best deployed. Aware of this, and powerless to do anything about it, they would ask periodically whether the spread-out appointment schedule might adversely affect Josie's progress, thereby pinpointing a knowledge gap. Little is known about the effects of service delivery: in terms of the primary *agent* of therapy, appropriate *dosage*, and optimal *scheduling*, and how they relate to outcomes (Dodd, 2009; Williams, 2012).

### Josie's therapy

Intervention commenced in November, and the content of her 15 (out of a possible 17) therapy sessions and brief details are listed in the next section. The reader may download from [www.speech-language-therapy.com](http://www.speech-language-therapy.com) many of the specific materials used in Josie's intervention.

**November to December, Age 6;6–6;7: 4 sessions over 4 weeks, Session 1: 40 minutes, Present: Josie, Maureen and Emma**

1. Stimulability Training (Phonetic Production Training) for /tʃ/ and /s/.
2. Sound-Picture-Symbol associations for all fricatives and affricates.
3. Auditory Discrimination Training for liquid /l/ versus the glide /j/ in CV words.
4. Auditory Discrimination Training for all fricatives and affricates in CV words.
5. Auditory Bombardment (Focused Auditory Input): /tʃ/ words SIWI (*hat shop chop*, etc.).
6. Near Minimal Pairs Games for /st/, /sp/, and /sk/ SIWI versus /t/, /p/, and /k/ SIWI.

7. Homework: 2–6 above, and Thematic Play for the voiceless affricate /tʃ/ SIWI. Thematic play was around Chinese cooking (with vocabulary like *Chinese*, *China*, *chopsticks*, *chicken chow mein* and *choy sum*), taking advantage of David's being an adventurous cook and the family's interest in Chinese culture and cuisine.

**Session 2: 40 minutes, Present: Josie, Maureen and Emma**

Josie was now stimulable for /tʃ/ SIWI in syllables and CV words *chew*, *chore*, *cha-cha-chachacha* and with intense concentration could imitate /s/ in isolation.

1. Verbal and visual imagery were introduced for /tʃ/ (the train sound), /dʒ/ (the tired train sound), and /s/ and the glides (/j/ or [ja ja] (the yes sound), and /w/ or [wa wa] (the cry-baby sound). Imagery was emphasised in sound-sorting games in which Josie had to select between glides and affricates (to target the elimination of her idiosyncratic gliding of affricates and fricatives).
2. Judgement of correctness game *chew*, *chore*, *cha-cha-cha* versus *Sue*, *saw*, *sah-sah-sah*.
3. Judgement of correctness game *chew*, *chore*, *cha-cha-cha* versus *ewe*, *your*, *ya-ya-ya*.
4. Auditory Discrimination Training for all fricatives, affricates and glides. Josie quickly learned to discriminate these, although she still had difficulty discriminating liquids from glides at word level. Emma enjoyed playing these games frequently with Josie.
5. Auditory Bombardment (Focused Auditory Input): /tʃ/ words SIWI and /s/ words SIWI
6. Production practice of 10 /tʃ/ SIWI CV and CVC words.
7. Near minimal pairs games for Final Consonant Deletion.
8. Homework: 4–7 above and practising producing /s/ in isolation.

**Session 3: 40 minutes, Present: Josie and David (40 minutes)**

1. Minimal triplets game with: *chew*, *shoe*, *sue*; *chip*, *ship*, *sip*; *chore*, *shore*, *sore*.
2. Rhyming cloze task: *shoe* rhymes with *ch...*, *Sue* rhymes with *ch...*, etc. for /tʃ/ SIWI.

3. Rhyming cloze task: *ewe* rhymes with *ch...*, *woo* rhymes with *ch...*, etc. for /tʃ/ SIWI.
4. Increased use of /ʃ/ was noted in conversation. Stimulability for /ʃ/ SIWI and SFWF was now present, so 8 production practice words for /ʃ/ SFWF were provided.
5. Production practice words for /tʃ/ SIWI were also provided.
6. 'Itchy Archie' was elicited, and Josie was promised a special sticker if she could still say it after the school holidays.
7. Games 4 and 5 from Session 2 were continued, using different words and syllables.
8. Near minimal pairs games for FCD (*bee beach*, *cow couch*, *A aitch*, *sir search*, *pea peach*)
9. Homework: 1–3 above.

**Session 4: 1 hour, 50 minutes, Present: David, Maureen and Emma**

This was a parent education session without Josie. It included PowerPoint shows on modelling, recasting and revisions and repairs. Detailed homework instructions for working with Josie in 5- to 7-minute 'bursts', once, twice or three times daily in the summer holidays were given. David kept in touch by e-mail, even attaching Josie's drawing of Itchy Archie as a Christmas card. The family's tasks were to model and reinforce /st/, /sp/ and /sk/, final consonant inclusion, and to do activities around /tʃ/, /dʒ/ and /s/, talking about the imagery and sound-letter-symbol associations, and to maintain stimulability. In this session, the difficulties both Maureen and Emma had with language processing and production, particularly the production of consonant clusters and polysyllabic words (PSWs), contrasted markedly with David's verbal abilities and quick grasp of what was needed.

## Consonant clusters and multisyllabic words

During Josie's initial consultation, it emerged that there was a maternal family history of speech and literacy issues. Maureen and Emma were poor readers and spellers, and Ruby was a late talker with unintelligible speech. Maureen's

conversation was characterised by many mispronunciations. For example, each time she attended with Josie, she mentioned that they would go to the village afterwards for an *advocargo sandwich*. She referred several times to a politician (The Hon Danna Vale MP) as *dallavale*, and frequently substituted *weave* for *we* (*If weave get there early...*), and referred repeatedly to the *district slimming carnival* (district swimming carnival), apparently without noticing. In addition, there were examples of subtle schwa insertion, especially with /pl/ and /bl/ in onset, in words like *platter*, *place*, *blister* and *blame* (/pəlætə/, /pəleɪs/, /bəlistə/, /bəleɪm/) and schwa deletion in words like *Malouf* and *believe* (/mluf/, /bliv/). From this speech behaviour in her mother, and the many citation-naming and spontaneous-speech consonant deletions Josie made at the outset – with words that included: *binoculars*, *butterfly*, *Beijing*, *carnival*, *computer*, *Dolly Magazine*, *Dumbledore*, *florist*, *mistake*, *octopus*, *play station*, *rain forest*, *Slim Dusty* (the family dog), *spaghetti* and *triangle* – Josie might have been expected to have particular difficulty conquering clusters and polysyllabic words, but she did not.

Dr. Debbie James is a speech pathologist and a lecturer at Southern Cross University on Australia's Gold Coast. Her expertise and research interests involve children with oral and written speech and language problems, centring on children's development of speech and language – especially their productions of polysyllabic words, language and literacy and speech improvement. Both Josie and Maureen were interesting relative to research by Dr. James into the possible clinical significance of consonant cluster errors, mispronunciation of multisyllabic words (XSWs), and consonant deletion errors, and she explores this possibility in A50.

**Q50. Deborah G. H. James:  
Underlying representations and  
surface forms of long words**

An interesting feature of Josie's intelligibility rating at 6;6 by her parents was that, even

though both spent an equivalent amount of time with her, her mother who may have had 'fuzzy' underlying representations and who had many speech errors in output found her to be 'mostly intelligible', whereas her father, who was highly competent verbally, found her 'mostly unintelligible'. Can you comment on the probable relationship in individuals with persistent errors with polysyllabic words and words containing clusters, between underlying representation and surface form? In working with children who appear to have persistent errors with clusters and XSWs, what testing would you suggest, and what are the clinical implications and the directions therapy might take?

**A50. Deborah G. H. James: The  
relationship between the  
underlying representation and  
surface form of multisyllabic  
words**

My interest in this relationship between children's productions of polysyllabic words and the underlying phonological representations (PRs) began with clinical observations of a mismatch between children's speech output skills whereby their performance on picture-naming tests was vastly superior to their conversational speech. This conundrum led me back to phonological theory and scrutinising the nature of words used in speech output tests. I observed that picture-naming speech tests usually comprised one- and two-syllable words but few words with three or more syllables (James, 2006), and wondered if this mattered. After completing a PhD, I decided that it *did* matter and now explain this. Concluding that clear nomenclature is important, I now use the term polysyllabic words to denote words of only three or more syllables. At times when it is expedient to group all words with two or more syllables, I use the term XSWs, cognisant that researchers use

these terms variously. For Davis (1998) for example, PSWs have four or more syllables, whereas other scholars have applied 'PSWs' and 'XSWs' to words of two or more syllables.

### Phonological representations and multisyllabic words and cluster errors

The notion that children's renditions of words provide insight into the quality of their underlying PRs is fascinating. If the idea holds, it may also have intriguing clinical implications for assessment *and* intervention. PR is the term used to describe the storage of the word's phonological information in long-term memory (Stackhouse & Wells, 1997). Accumulating evidence that accurate speech output depends on a robust PR indicates that the more accurate a person's output, the more accurate and fine-grained is the corresponding PR (Hesketh, Dima & Nelson, 2007; Sutherland & Gillon, 2005, 2007). It also implies interdependency, whereby improvement in one is associated with improvement in the other. For example, interventions designed to enhance the quality of the PR *and* output alters output (Baker, 2000; Bowen & Cupples, 1999a; Habers, Paden & Halle, 1999). Even more interesting are reports of intervention aimed only at enhancing the PRs that alter output (Moriarty & Gillon, 2006; Weiner, 1981). Moreover, studies of simultaneous treatment of PR *and* output proved more effective than treating output alone (Gillon, 2000; Hesketh et al., 2007).

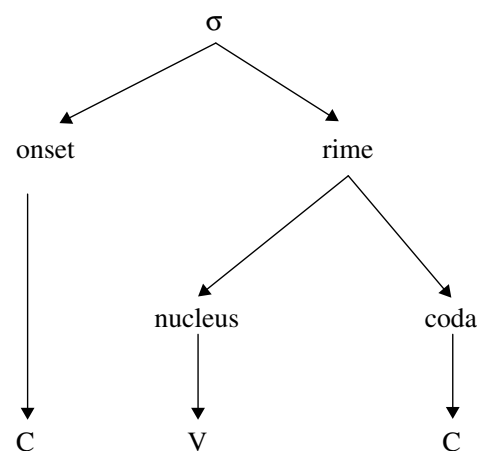
### An asymmetrical relationship

This PR-to-output relationship, however, appears asymmetrical, when children with typical speech have poor phonological processing. This apparent asymmetry weakens when noting syllable numbers in words used for testing speech. When speech testing relied on one- and two-syllable words, the

relationship between speech and PRs was absent or weak (Bishop & Adams, 1990; Catts, 1993). By contrast, a relationship was present when testing incorporated nine or more XSWs (Elbro, Borstrøm & Petersen, 1998; Larrivee & Catts, 1999; Leitão, Hogben & Fletcher, 1997; Lewis & Freebairn, 1992; Lewis, Freebairn & Taylor, 2000, 2002; Stothard, Snowling, Bishop, Chipchase & Kaplan, 1998). This suggests that XSWs provide unique information.

### The uniqueness of multisyllabic words

Examining the internal structure of syllables contributes to understanding the unique information that XSWs provide. Syllable constituents include onsets, rimes, nuclei (vowels) and codas (the final consonant or consonant cluster). These constituents are modelled hierarchically, as displayed in Figure A50.1. The rime is the obligatory syllable head and its partner, the onset, is optional, allowing for words without onsets, such as *eye* and *egg*. In English, the number of consonants in the onset can vary from zero to three. The rime contains the obligatory nucleus and its optional partner, the coda, which, in English, can comprise zero to four



**Figure A50.1** The structure of a syllable

consonants. Consequently, syllable shapes vary from one sound to eight sounds in words such as *owe* /ou/ and *strengths* /streŋkθs/.

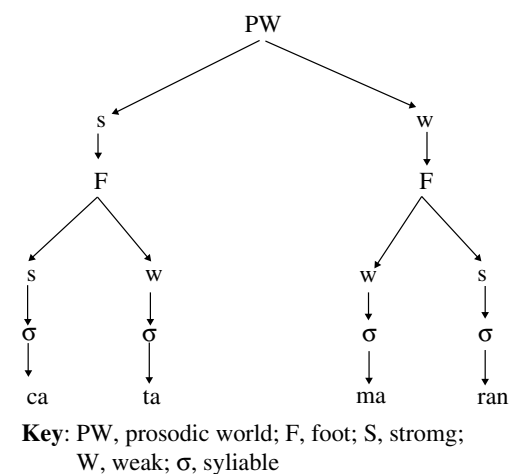
The nucleus is the most prominent syllable constituent because it is the most sonorous (Baker, A13) resulting from an open vocal tract. Conversely, the onsets and codas at the syllable edges are relatively less prominent because the vocal tract is less open. The sonority profiles of syllables vary as their shapes and sounds within them vary, being lower at the syllable edges and peaking at the nucleus. Syllables with steeper sonority gradients are more salient than those with shallower gradients. Notably children tend to say words and/or syllables with steeper gradients more accurately than those with shallower gradients (Kehoe, 2001). For example, the word *bat* is more salient than *man* because of the greater sonority differential between its edges and nucleus than that of *man*. This is so because voiceless stops are less sonorous than nasals, giving rise to greater contrast. Similarly, syllables with onset and/or coda consonant clusters are less salient than their near minimal pair counterparts with singleton consonants because the change in sonority gradient from the syllable edge to the nucleus is more gradual. The sonority gradient in *black* is flatter than in *back*. This theory predicts children find it easier to extract sufficient details from *bat* and *back* than *man* and *black* to yield adult-like renditions, so adult-like renditions of *bat* and *back* will probably emerge before those of *man* and *black*. For all four words, the PR in young children is likely to be holistic but, possibly, the PR of *man* and *black* has to be more fine-grained than that of *bat* and *back* to yield an output of equivalent accuracy. This same logic applies to XSWs, that is, their PR may need to be even more fine-grained to yield an output of equivalent accuracy to monosyllabic words so that the additional phonological constituents are present in output. Further, some of the unique features of XSWs may strain extraction abilities more than monosyllabic words.

Another source of uniqueness of XSWs relates to the types of consonant sequences they may contain. In addition to consonant clusters, XSWs also include coda-onset sequences when codas and onsets abut at syllable edges. This generates sequences such as /k.t/, /m.b/, /dʒ.t/ /m.bj/ and /p.t/: *octopus*, *hamburger*, *vegetables*, *ambulance* and *helicopter*, respectively; of which none are legal onset clusters and only some are legal coda clusters (Clark & Yallop, 1995).

A third source of uniqueness is the many different levels of stress in XSWs. For example, *catamaran* with four syllables has four levels of stress, as displayed in Figure A50.2, as does, *hippopotamus* with five syllables. Your first reaction may be 'Sorry? There are only three levels of stress, primary, secondary and weak that can apply to words, and for *hippopotamus*, there are only strong and weak syllables'. This is true (Roca & Johnson, 1999). However, more levels can occur because of the metrical structure of words.

### Metrical structure

Within metrical phonology (Selkirk, 1984), syllables gather into feet, and feet gather into prosodic words. As displayed in Figure A50.2 *catamaran* is one prosodic word with four syllables in 2 feet. A foot typically consists of



**Figure A50.2** The metrical structure of *catamaran*



two syllables; a head one which is strong, and second one with secondary or weak stress. A prosodic word can contain one or more feet and where there is more than 1 foot, one is more prominent than the other, giving rise to a number of different levels of stress in a word. Because the first foot in *catamaran* is the more prominent one, its strong syllable is more prominent than its counterpart in the second foot, and the same holds for the two weak syllables in both feet, resulting in four different levels of stress.

A fourth source of uniqueness of XSWs is that they contain within-word *weak* syllables, such as the two in *cata.maran*, whereas mono- and disyllabic words cannot. In these words, weak syllables be a whole word, such as *the* in a phrase *the cat*, or they can occur first or last in disyllabic words (e.g., *giraffe* or *cola*). The importance of checking children's ability to realise within-word weak syllables, or non-final weak syllables, is underscored by the findings of Aguilar-Mediavilla, Sanz-Torrent and Serra-Raventos (2002), who reported that children with language impairment, aged 3;10 to 4;10, had more difficulty with them than their typically developing peers.

### Assessment implications

Based on the above information and my findings (James, 2006), I echo Stackhouse (1985), Watts (2004) and Young (1991, 1995), who recommended that PSWs words be included routinely in child speech assessment. Importantly, their inclusion enhances *content validity* of testing because a wider array of phonological variables is sampled, including stress, non-final weak syllables and coda-onset consonant sequences. It also enhances *construct validity* because they reveal more age-related differences between groups of typically developing children than mono- and disyllabic words do (Ballard, Djaja, Arciuli, James & van Doorn, 2012; James, 2006;

James, van Doorn, McLeod & Esterman, 2008). Children are still mastering stress marking in words that begin with weak syllables such as *potato* and *tomato* between 3 and 7 years whereas it is adult-like by 3 years in words such as *butterfly* and *caterpillar* (Ballard et al., 2012). Metathesis occurred in disyllabic and PSWs but not in monosyllabic words. Also, age differences for metathesis only occurred in PSWs and not in the disyllabic words (James, 2006). They also reveal disorder-related differences, as for some children, their impairments are only apparent in PSWs (see James, 2006, for a literature review). Excluding PSWs from testing jeopardises identifying children's phonological processing and speech output difficulties that are only evident in PSWs.

### Caveat

For the reasons expounded above, some PSWs are easier for children to say than others, thus it is important to use those that are clinically useful. James (2006) showed that the uniting features for clinically useful words were (a) non-final weak syllables with sonorant onsets or codas, especially the liquid /l/; (b) consonant sequences, especially those requiring an anterior/posterior articulatory movement; and (c) consonants that shared place or manner features, especially sonorants. These 10 PSWs: *ambulance*, *hippopotamus*, *computer*, *spaghetti*, *vegetables*, *helicopter*, *animals*, *caravan*, *caterpillar* and *butterfly*<sup>1</sup>, proved to be the most clinically useful of the 39 PSWs used in the study because age differences were apparent.

### Therapy

Given the evidence that working with phonological awareness brings about

<sup>1</sup> Pictures of the 10 PSWs are available from [www.speech-language-therapy.com/pdf/djwordsBW1p.pdf](http://www.speech-language-therapy.com/pdf/djwordsBW1p.pdf)

positive changes in the output, coupled with the assumption that accurate PSW production requires a more fine-grained PR than mono- and disyllabic words, I recommend including PSWs among the usual therapy targets and techniques. Examples include incorporating them into *focused auditory input* (Hodson, 2007, 2010 A5) and *Auditory Input Therapy* (Lancaster, A24; Lancaster, Levin, Pring & Martin, 2010), *perceptually based interventions* (Rvachew, A25), and *minimal pair therapy* (Barlow & Gierut, 2002). Alternatively, one could work with families of them, such as those displayed in Table A50.1, exploring their similarities and differences.

In conclusion, by using PSWs in the management of paediatric speech impairment, several clinical efficiencies can be achieved. Clinicians can sample and expose children to a greater array of phonological variables than many mono- and disyllabic words permit. This is especially relevant for clinicians working with school-aged children because developmental changes occur more frequently in PSWs words with few, if any, in mono- and disyllabic words. It also seems that working with these variables is simultaneously enhancing the PR, thereby working on phonological awareness (for literacy) as well as speech output.

**Table A50.1** Quasi minimal pairs and word families in PSWs

Root word; word	Words with C+/jul/*	Words with initial weak syllable	Some quasi minimal pairs
ward	binoculars	spaghetti	reminder,
award/ing	ridiculous	zucchini	remember
reward/ing	funicular	tomato	remainder
toward	meticulous	potato	veranda
forward	folliculous	banana	Miranda
backward	fasciculus	pyjamas	Kuranda surrender

These words were listed by Gilbert and Johnson (1978).

### Session 5: 1 hour, 10 minutes, Present: Josie, Maureen and David

The *Quick Screener* was administered again (Figure 9.9) with parents observing, and discussed. Josie was now stimutable for all consonants to two-syllable positions except /l/ and /f/. Her SW PCC was 65% and her Conversational PCC 50% in the clinic. There had been improvement in syllable structure with a significant reduction in final consonant deletion from 66% to zero, glottal replacement was almost eliminated, and she was attempting longer words with greater confidence, but with pervasive weak syllable deletion. Velar fronting was now confined to the velar nasal /ŋ/ only. The occurrence of pre-vocalic voicing, which had not been directly targeted, had dropped to 14% (previously 57%). Similarly, cluster reduction had dropped from 100% to 50% SI and 83% SF. Gliding of liquids had not changed and still stood at 100%, and stopping of fricatives (bearing in mind that she had been *gliding* fricatives) had risen to 50% SIWI and 83% SFWF. There were vowel replacements in words 13, 14, 21 and 41, and it appeared that minimal pair work for consonants, and possibly the increased attention to speech generally at home, was having a beneficial effect on vowel production also.

1. The adjuncts /st/, /sp/, and /sk/ needed more work. This was undertaken by using a multiple oppositions approach, using imagery cues, and the fixed-up-one routine for *all* s-clusters (not just the three s + voiceless stop adjuncts).
2. PSWs for production practice, focusing on weak syllable inclusion, were provided.
3. /s/ versus /ʃ/ minimal pair activities were done in the session and given for homework, along with /st/, /sp/ and /sk/ SIWI for production practice. The family were instructed to model /s/ constantly in all contexts, including polysyllables.
4. Homework: 3 and 4 above, with Josie being rewarded strongly for performing self-corrections.

**Josie 6;9 PCC SW 65% CS 50%**

#	TARGET	TRANSCRIPTION	CC	#	TARGET	TRANSCRIPTION	CC
1	cup	ʌ kʌ p	2	23	jam	æ tʃ æ m	1
2	gone	ɒ g ɒ n	2	24	house	aʊ h æʊ	1
3	knife	aɪ n aɪ p	1	25	path	a pas	1
4	sharp	a ʃ a p	2	26	door	ɔ d ɔ	1
5	fish	ɪ b ɪ ʃ	1	27	smoke	ou s m ou k	3
6	kiss	ɪ k ɪ t	1	28	bridge	ɪ w ɪ tʃ	0
7	sock	ɒ ʃ ɒ k	1	29	train	eɪ t ɹ eɪ n	3
8	glass	a g w a tʃ	1	30	chair	εə tʃ εə	0
9	watch	ɒ w ɒ tʃ	2	31	red	e w e d	1
10	nose	ou n ou dʒ	1	32	spoon	u s b u n	2
11	mouth	au m au p	1	33	plane	eɪ p weɪ n	2
12	yawn	ɔ j ɔ n	2	34	fly	aɪ j aɪ	0
13	leaf*	i j ə ɪ p	0	35	sky	aɪ s k aɪ	2
14	thumb	ʌ θ ʌ m	2	36	sun	ʌ sd ʌ n	2
15	foot*	ʊ b u t	1	37	wing	ɪ w ɪ n	1
16	toe	ou t ou	1	38	splash	æ pw æ ʃ	2
17	snake	eɪ sn eɪ k	3	39	tent	e te n t	3
18	van	æ b w æ n	1	40	salt	ɒ sd ɒ t	2
19	fast	a b a st	2	41	crab*	æ w a b	1
20	girl	ɜ g ɜ u	1	42	sweet	i s w i t	3
21	stairs*	eə sd e z	2	43	sleeve	i s w i d	1
22	big	ɪ b ɪ g	2	44	zipper	ɪ s ɪ p	1
boy bɔɪ ear eə			SUBTOTAL CC:	32	* VowelReplacement		TOTAL CC: 65

**Figure 9.9** Josie's second Quick Screener record form at 6;9

**February to April, Age 6;9–6; 11 – 5 sessions over 8 weeks (2 cancellations), Session 6 Present: Josie, Maureen, Emma and Maureen's sister**

Maureen's sister, who normally minded the twins while Josie came to therapy, drove Josie, Emma and Maureen to the appointment because David was working. Josie was not well and they only stayed briefly. No homework was provided and, Josie was unable to attend her appointment the following week because she was still unwell.

**Session 7: 60 minutes, Present: Josie and David**

1. The whole session was devoted to clusters, 'two step words' (cluster words), 'three part words' and 'four part words' (polysyllables), with 'finger walking' and *silent* tapping of syllables.
2. Using pictures from her 'speech book', Josie took great pleasure in making up her own (rather bizarre) fixed-up-one routine for clusters.
3. Homework: Reinforcement of self-corrections by David, Maureen and Emma, and Josie was

to take the speech book to school for a pat on the back from her teacher, who rose to the occasion!

**Session 8: 40 minutes, Present: Josie and David**

1. The velar nasal was introduced in minimal pairs (win wing, pin ping, bun bung, etc.), with multiple exemplar games and thematic play. At home, they modelled the velar nasal, modelled polysyllables (to target weak syllable deletion), and did daily production practice of polysyllables.
2. Josie was still unable to produce /f/ in CVs, but she could in VCs provided they were not real words that she knew (e.g., she could produce *uff* and *eef*, but not *if*, *off* and *eff*).
3. Homework: She was given a challenge to 'perfect' -iff, -off, -aff and -uff over the next week.

**Session 9: 40 minutes, Present: Josie and David**

1. Although clusters continued to be problematic, the velar nasal generalised within a week.
2. Playing a hunch that we could capitalise on her recent success with nasals, nasal clusters SF were emphasised for a week, particularly /-ŋk/ (sink, pink, wink, drink, link, etc.), but also /-nt/ and /-nd/.
3. Building on '-iff, -off, -aff and uff', 'iffy offy, affy and uffy' were established in the session and sent home to 'perfect'.
4. A judgement of correctness task and a fixed-up-one routine for homework, and final /-ŋk/, /-nt/ and /-nd/ words for production practice were provided (three of each).
5. Homework: 3 and 4 above.

**Session 10: 40 minutes, Present: Josie, Maureen and David**

The *Quick Screener* (Figure 9.10) was administered and discussed, with David doing most of the scoring! The final cluster strategy worked, and by the next session, Josie was using them inconsistently in *careful* CS.

1. Minimal pair games for stopping of fricatives were introduced.
2. Using a backward chaining technique, Josie managed at long last to produce /f/ SIWI, so: iffy-fee, offee-fee, affy-fee.
3. Homework: The family was to maintain Josie's ability to produce /f/ SIWI and to model in general. No specific homework was given, and Josie was asked to put her speech book and other materials away in a safe place and have a break. This was presented as a reward for a terrific effort on her part.

**June: 3 sessions over 4 weeks, age 7;1, Session 11: 1 hour, 10 minutes, Present: Josie, Maureen and David**

Josie's SW and conversational PCCs were now around about the same. Disappointingly for her, she was barely stimulable for /f/ SIWI and SFWF, and there had been no functional generalisation. She was still not stimulable for /l/, but she was now usually replacing /l/ with liquid /ɹ/ and not a glide /j/, and this replacement of a liquid with a liquid was interpreted as progress.

1. We decided to focus on /f/ and /v/ concurrently, using a combination of traditional phonetic production training and multiple exemplar activities and the aspiration trick (the f-hat, f-heat strategy; see [www.speech-language-therapy.com](http://www.speech-language-therapy.com)).
2. Homework: /f/, /f/, and more /f/! And /v/!

**Session 12: 40 minutes, Present: Josie, Maureen and David**

1. Production practice of /f/ SIWI and /fɹ/ SIWI words.
2. Production of /ft/ using lexical innovation (laugh/laughed, cough/coughed, etc.).
3. Auditory bombardment using /f/ versus /v/ minimal pairs (fat-vat, fine-vine, fail-veil, etc.).
4. Auditory discrimination games for /ɹ/ and /l/ (lung-rung, lead-read, list-wrist, etc.).
5. Homework: 1–4 above and modelling and frequent recasting for /f/ and /v/.

#	TARGET	TRANSCRIPTION	CC	#	TARGET	TRANSCRIPTION	CC
1	cup	ʌ kʌ p	2	23	jam	æ dʒ æ m	2
2	gone	ɒ g ɒ n	2	24	house	aʊ h æʊ s	2
3	knife	aɪ n aɪ s	1	25	path	a pas	1
4	sharp	a ʃ a p	2	26	door	ɔ d ɔ	1
5	fish	ɪ ʃ ɪ ʃ	1	27	smoke	ou s m ou k	3
6	kiss	ɪ k ɪ s	2	28	bridge	ɪ ɹ ɪ dʒ	2
7	sock	ɒ s ɒ k	2	29	train	eɪ t ɹ eɪ n	3
8	glass	a g w a s	2	30	chair	εə tʃ εə	1
9	watch	ɒ w ɒ tʃ	2	31	red	e ɹ e d	2
10	nose	ou n ou z	2	32	spoon	u s p u n	3
11	mouth	au m au θ	2	33	plane	eɪ p w eɪ n	2
12	yawn	ɔ j ɔ n	2	34	fly	aɪ s w aɪ	0
13	leaf	i j i s	0	35	sky	aɪ s k aɪ	2
14	thumb	ʌ θ ʌ m	2	36	sun	ʌ s ʌ n	2
15	foot	ʊ s ʊ t	1	37	wing	ɪ w ɪ ŋ	2
16	toe	ou t ou	1	38	splash	æ s p ɹ æ ʃ	3
17	snake	eɪ s n eɪ k	3	39	tent	e te n t	3
18	van	æ b æ n	1	40	salt	ɒ s ɒ t	2
19	fast	a s a s t	2	41	<u>crab</u> *	æ ɹ a b	2
20	girl	ɜ g ɜ u	1	42	sweet	i s w i t	3
21	<u>stairs</u> *	eə s t e z	3	43	sleeve	i s w i z	1
22	big	ɪ b ɪ g	2	44	zipper	ɪ z ɪ p	2
SUBTOTAL CC			38	TOTAL CC			82

Figure 9.10 Josie's third *Quick Screener* record form at 7;1

**Session 13: 40 minutes, Present: Josie, David, Maureen and Emma**

This was an thought-provoking session in which the family reviewed progress and future plans. Josie's name had come up on the Community Health waiting list, and they had been informed, to their surprise, that she had already been seen once at school by a newly appointed SLP. They were torn between staying with someone they knew and accessing a local service minutes by car from their home, commencing in late January. They decided to proceed with three scheduled appointments in September (2 sessions) and November (1 session) with me before chang-

ing to the new clinician. Therapy and homework were the same as for Session 12, with different vocabulary and games, plus auditory bombardment for /l/ SIWI.

**September: 2 sessions over 4 weeks, age 7; 3–7;4, Session 14: 40 minutes, Present: Josie and David**

1. More work on /f/ and /v/ in story retelling and narrative tasks. Both targets were beginning to show functional generalisation. This was so exciting for Josie, who commented, 'Ept, uh eff is my hard one, isn't it? But I can do it when I think!'



2. Homework: none, other than praising Josie (KR feedback), who was self-monitoring constantly.

**Session 15: 40 minutes, Present: Josie and David**

1. In the session, /l/ was elicited (in 'la') for the first time!
2. Homework: production practice: la-la-laugh, la-la-laugh, la-la-last, etc. and auditory bombardment for /l/ SIWI and SIWW.

**November: 1 session, Age 7;6, Session 16: 40 minutes, Present: Josie, David, Maureen and Emma**

The Screener was administered for the final time at the parent's request while the family

observed (Figure 9.11). Her PCC in SW and CS was 93% or thereabouts. Josie was able to produce *laugh*, *last*, *llama*, *latte*, *Lana*, etc. perfectly, but was unable to produce /l/ preceding vowels other than /a/. Her speech was fully intelligible, and the only outstanding difficulties were with /l/ and a tendency to replace /eə/ with /e/ or /ɛ/. Josie was looking forward to seeing the Community Health SLP in the New Year. The case notes and a brief report were provided to David and Maureen for them to share with the SLP. Attempting to execute a smooth changeover, I left two telephone messages at the SLP's workplace and e-mailed her, but received no response. David also requested that the SLP speak to me and was told that Josie's speech difficulties were so mild that case discussion was unnecessary.

#	TARGET	TRANSCRIPTION	CC	#	TARGET	TRANSCRIPTION	CC
1	cup	ʌ kʌ p	2	23	jam	æ dʒ æ m	2
2	gone	ɒ g ɒ n	2	24	house	aʊ h æʊ s	2
3	knife	aɪ n aɪ f	2	25	path	a p a θ	2
4	sharp	a ʃ a p	2	26	door	ɔ d ɔ	1
5	fish	ɪ f ɪ ʃ	2	27	smoke	oʊ s m oʊ k	3
6	kiss	ɪ k ɪ s	2	28	bridge	ɪ b ɹ ɪ dʒ	3
7	sock	ɒ s ɒ k	2	29	train	eɪ t ɹ eɪ n	3
8	glass	a g w a s	2	30	chair	εə tʃ εə	1
9	watch	ɒ w ɒ tʃ	2	31	red	e ɹ e d	2
10	nose	oʊ n oʊ z	2	32	spoon	u s p u n	3
11	mouth	au m au θ	2	33	plane	eɪ p w eɪ n	2
12	yawn	ɔ j ɔ n	2	34	fly	aɪ f w aɪ	1
13	leaf	i ɹ i f	1	35	sky	aɪ s k aɪ	2
14	thumb	ʌ θ ʌ m	2	36	sun	ʌ s ʌ n	2
15	foot	ʊ f ʊ t	2	37	wing	ɪ w ɪ ŋ	2
16	toe	oʊ t oʊ	1	38	splash	æ s p ɹ æ ʃ	3
17	snake	eɪ s n eɪ k	3	39	tent	e te n t	3
18	van	æ v æ n	2	40	salt	ɒ s ɒ t	2
19	fast	a f a s t	3	41	crab*	æ k ɹ a b	3
20	girl	ɜ g ɜ ʊ	1	42	sweet	i s w i t	3
21	stairs*	eə s t e z	3	43	sleeve	i s w i v	2
22	big	ɪ b ɪ g	2	44	zipper	ɪ z ɪ p	2
SUBTOTAL CC			44	TOTAL CC			93

Figure 9.11 Josie's fourth and final Quick Screener record form at 7;6

## Epilogue

The following May, Maureen visited unexpectedly with her sister, but not Josie, to report progress. Josie, now 8;0, had been seen by her new therapist for a language assessment over 2 sessions. She had a composite language score of 100 on the CELF-4 Australian. She was grouped with two boys for weekly 30-minute sessions to work on a common target, /l/, in the lunch period at school, and a Reading Recovery teacher did individual 'l-homework' (but not Reading Recovery) with Josie and each of the boys twice weekly. No speech (or other) homework was sent home for any of the children. She had 8 group therapy sessions over 8 weeks with the SLP and 12 individual sessions with the Reading Recovery teacher, and was dismissed from therapy because she had reached the maximum allocation. Maureen was unsure, but she thought /l/ had not improved. She had not spoken to the SLP since the CELF-4 assessment. Maureen happily reported that Josie had maintained her other progress and was doing quite well academically in Year 2 (the third year of formal schooling in NSW). Plans to home-school her had been suspended for the time being because Josie was now enjoying school. Maureen said she and David might re-contact 'if the ells don't come good'.

Josie made remarkable progress with comparatively little SLP intervention in terms of therapist hours, and one has to wonder whether the outcome would have been so positive if her intervention had happened in the hands of a non-SLP within a typical (and increasingly prevalent) consultative framework or through an aide (McCartney et al., 2005).

She was on my caseload from 6;5 to 7;6. In that time, she had a language assessment (1 session), an initial speech assessment (1 session), and 15 intervention sessions, some of which incorporated ongoing assessment as required. She had two missed appointments due to illness. In all, she had 12.5 hours of in-clinic face-to-face intervention, requiring 3–4 hours of preparation for sessions by the clinician, plus the therapist's Einstein Time!

Her family's dedication to keeping scheduled appointments, participating in sessions, learning relevant skills, encouraging each other, helping Josie to maintain a positive attitude, implementing homework meticulously, and making it fun provides a wonderful example of what can be achieved even with tight limitations on the amount of intervention that can be administered. It also exemplifies the value of the SLP/SLT taking the time to plan explicitly principled therapy; the advantages of careful target selection with an eye to generalisation across a child's phonological system; the benefits of painstaking stimulability training; and the profound changes that can occur when the clinician manages every aspect of intervention him- or herself, in person, in a team effort with child and family.

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## Acknowledgement

Thanks are extended to Josie and her family for sharing their story; and to two of her SLPs for their willing participation in providing assessment data and other information.

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