

## Research Article

# Treating Childhood Speech Sound Disorders: Current Approaches to Management by Australian Speech-Language Pathologists

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**Purpose:** This study explored the intervention processes used by speech-language pathologists (SLPs) to treat children with speech sound disorders (SSDs).

**Method:** Semistructured, individual, in-depth interviews were conducted with 11 Australian SLPs. Inductive content analysis was used to classify the data to provide a description of current intervention processes for children with SSDs.

**Results:** Three main factors were identified relating to the intervention processes used by SLPs: (a) target selection, (b) therapy approaches, and (c) structural and procedural aspects of therapy sessions, including feedback. The findings revealed that SLPs often combine elements of four

therapies: the minimal pairs approach, traditional articulatory approaches, auditory discrimination, and Cued Articulation. Initial therapy targets typically aligned with a developmental approach or were functional speech targets with meaningful relevance to the child and their family.

**Conclusions:** These findings contribute to the current state of knowledge about the intervention processes used by SLPs for children with SSDs. The use of hybrid speech pathology therapies, which combined elements of favored approaches, was common. Hybrid methods were intended to help tailor the interventions to individual needs. Client needs were highly prioritized by SLPs and influenced their choice of therapy targets and therapy approaches.

A key principle of evidence-based practice (EBP) is that clinical decisions should be made with equal consideration of the three elements of EBP: (a) best available evidence from scientific literature (external evidence) and client data (internal evidence); (b) professional and clinical expertise; and (c) the client's values, perspectives, and circumstances (American Speech-Language-Hearing Association, n.d.; Erickson et al., 2018). Speech-language pathologists (SLPs) face the challenge of weighting these three elements when making clinical decisions for children

with speech sound disorders (SSDs) relating to target selection, therapy approaches, and the structural or procedural aspects of intervention. Given that children with SSDs represent a high proportion of typical pediatric SLPs' case-loads, these would seem to be routine decisions. However, the contemporary empirical evidence relating to the management of childhood SSDs is extensive and somewhat conflicting.

## Best Available Scientific Evidence

### Target Selection

There are many and varied recommendations relating to target selection for SSDs (McLeod & Baker, 2014). Debate exists about whether SLPs should follow a developmental approach (i.e., to target early developing, stimulatory sounds) or a complexity approach (i.e., to target later developing, nonstimulatory, and phonetically more complex sounds). A complexity approach reportedly facilitates more rapid progress and system-wide improvements in the phonological system than a developmental approach (Gierut, 2007). However, Rvachew and Nowak (2001) reported greater progress toward acquisition of target phonemes and

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higher parental satisfaction with treatment progress using a developmental approach, compared to a complexity approach (Rvachew & Nowak, 2001). Beyond developmental and complexity approaches, Baker and McLeod (2011) identified a further five distinct target selection methods across the 134 studies included in their narrative review of intervention studies for SSDs. These were a cyclical approach for sequencing patterns and nonlinear, systemic, psycholinguistic, and whole-language approaches (Baker & McLeod, 2011).

Surveys and questionnaires that have explored SLPs' clinical practice suggest that, when selecting targets for therapy, SLPs frequently consider or highly prioritize traditional variables (Brumbaugh & Smit, 2013; McLeod & Baker, 2014). Functional words, which may include words containing sounds in the child's name or words that the parent would like the child to say, were considered often or always by more than half of the 402 SLPs in an American survey by Brumbaugh and Smit (2013). In Baker and McLeod's (2011) survey, sounds in the child's name or sounds that the parent would like the child to say were given medium priority by the 231 SLP participants.

### Therapy Approaches

A 2011 review of interventions for children with SSDs revealed that most published research has used uncontrolled study designs from the lower part of the American Speech-Language-Hearing Association ranking system (by research design; Baker & McLeod, 2011). Only 22 of the 134 included studies were randomized controlled trials or meta-analyses (Baker & McLeod, 2011). Such studies typically provide credible and internally valid evidence. Nevertheless, they are sometimes criticized for their perceived poor external validity or the perception of a lack of generalizability to everyday clinical settings (Connor & Pettigrew, 2009). Baker and McLeod (2011) identified 86 efficacy studies for SSDs (i.e., designed to demonstrate the performance of the intervention in ideal circumstances), but only two effectiveness studies (i.e., studies conducted in real clinical settings). Baker and McLeod highlighted the need for increased research collaboration between SLPs and researchers to help address concerns around lack of generalizability of research findings to clinical settings. Few comparative studies evaluating the outcomes of different therapy approaches were identified, making it difficult to endorse any single therapy approach as universal best practice (Baker & McLeod, 2011). Furthermore, children with SSDs do not present as a homogeneous group in terms of their number of errors, types of errors, level of intelligibility, or response to therapy. They may present with articulation errors, phonological errors, or both (Dodd et al., 2018); this can add to the challenge of applying research evidence when selecting a therapy approach.

There is a choice of as many as 46 distinct therapy approaches for SSDs (Baker & McLeod, 2011). Increasingly, for phonologically based SSDs, phonologically based approaches are being shown to be more effective (Williams et al., 2010) and efficient (Lousada et al., 2013) than traditional articulatory approaches. In a meta-analysis of

treatment efficacy for children with speech and language impairment, Law et al. (2004) reported that phonological therapy was effective for children with SSDs. They reported a statistically significant effect size based on six studies ( $d = 0.44$ ,  $n = 264$ , CI [0.01, 0.86]), which favored phonological therapy over no therapy. The effect size increased when parent-administered interventions were removed ( $d = 0.67$ ,  $n = 214$ , CI [0.19, 1.16]) and again when interventions lasting less than 8 weeks were removed from the analysis ( $d = 0.74$ ,  $n = 213$ , CI [0.14, 1.33]; Law et al., 2004).

It is widely reported that SLPs frequently adopt an eclectic therapy approach (Brumbaugh & Smit, 2013; Hegarty et al., 2020; Joffe & Pring, 2008; McLeod & Baker, 2014; Oliveira et al., 2015; Pascoe et al., 2010; Roulstone & Wren, 2001) rather than a single approach. An eclectic approach involves blending different therapy approaches or elements of different methods (Lancaster et al., 2010; McLeod & Baker, 2014). For example, in a survey by Joffe and Pring (2008), SLPs reported combining three therapies incorporating different levels of input and output processing. These three therapies were auditory discrimination, meaningful minimal contrast, and phonological awareness (Joffe & Pring, 2008). In a study by Lancaster et al. (2010), an eclectic approach was characterized as the combination of different methods involving perceptual, processing (e.g., phonological awareness), and production tasks. An eclectic approach reportedly draws elements from six approaches: traditional articulation (McLeod & Baker, 2014; Pascoe et al., 2010; Roulstone & Wren, 2001), phonological awareness (Joffe & Pring, 2008; McLeod & Baker, 2014; Pascoe et al., 2010; Roulstone & Wren, 2001), the minimal pairs approach (Joffe & Pring, 2008; McLeod & Baker, 2014; Oliveira et al., 2015; Pascoe et al., 2010; Roulstone & Wren, 2001), whole language (Pascoe et al., 2010), Cued Articulation (McLeod & Baker, 2014; Pascoe et al., 2010; Passy, 1986), and auditory discrimination (Joffe & Pring, 2008; McLeod & Baker, 2014; Oliveira et al., 2015; Pascoe et al., 2010). Eclectic practice is, nevertheless, potentially problematic. Implementation fidelity for both content and dose of the various therapy elements is difficult to replicate and measure with eclectic practice (Dusenbury et al., 2003). Furthermore, the therapies often used within an eclectic approach may only have evidence for their use in isolation, not in combination with other therapies.

### Structural and Procedural Aspects of Therapy Sessions

The structural and procedural aspects of therapy sessions involves consideration of (a) the instructional cues used to elicit responses from the client and provide feedback and (b) the selection and organization of therapy stimuli, resources, and activities within the therapeutic interaction (McLeod & Baker, 2017; Paul & Cascella, 2014).

Instructional cues, including prompting, modeling, positive reinforcement, and performance-based feedback, are an important part of any therapy interaction and have been identified as one of the most significant variables affecting motor skill learning (Kim et al., 2012). Within the therapy interaction, instructional cues are provided within

a three-step remedial sequence, involving an antecedent, behavior, and consequence (Roth & Worthington, 2011). Antecedents or elicitation techniques frequently used by two thirds of the SLPs in Brumbaugh and Smit's (2013) study included phonetic placement cues; iconic gestures; and verbal, pictorial, or graphic cues. Half of the SLPs frequently used a label or name for the target phoneme to elicit a desired response (Brumbaugh & Smit, 2013). Speech pathology textbooks for students and graduate SLPs offer an explanation of a number of additional elicitation techniques, such as successive approximation or shaping, manual guidance, and pragmatic cues (McLeod & Baker, 2017; Paul & Cascella, 2014).

The consequent event or feedback that SLPs provide to their clients is intrinsic to the success of the therapy in order to facilitate accuracy, sustain attention and motivation, and move clients toward their communication goals (Maas et al., 2008). Performance feedback relates specifically to the behavior or the response of the client and can take the form of knowledge of results or knowledge of performance. More than 70% of participants in Brumbaugh and Smit's (2013) study of therapy sessions for children with SSDs provided knowledge of performance (78%), knowledge of results (73%), or corrective feedback for incorrect productions (70%). Other forms of feedback such as self- or peer evaluation were less commonly used (Brumbaugh & Smit, 2013).

Another important decision for SLPs relates to the selection and organization of therapy stimuli, resources, and activities. These vary along a continuum of naturalness (Fey, 1986). Clinician-directed approaches are highly structured and the least natural. The most commonly employed clinician-directed approaches are drill and drill play (Paul & Cascella, 2014). At the other end of the continuum of naturalness are client-centered approaches, such as daily activities and facilitative play, for which the intervention and feedback are provided within more naturalistic contexts (Paul & Cascella, 2014). It is argued that management of the therapeutic interaction is a unique part of SLPs' knowledge and skill set as clinicians (Gardner, 2006; Horton & Byng, 2000), yet research studies of SLPs' clinical practice for children with SSDs have been limited in their exploration of this topic. Understanding the procedural and structural aspects of therapy sessions for children with SSDs, including the instructional cues used by SLPs, is important for enhancing our awareness and knowledge of the therapeutic interaction (Gardner, 2006) and the ways in which this may impact the outcomes of therapy (Horton & Byng, 2000).

The external scientific evidence for SSDs relating to target selection, therapy approaches, and (to a lesser extent) the structural and procedural aspects of therapy sessions has been well considered within the EBP framework; less has been done on the professional and clinical expertise side of the EBP triangle to privilege the *voices* of SLPs working in this area of practice (Hegarty et al., 2020). The aim of the current study was to gain an in-depth insight into the intervention processes used by SLPs for treating children with SSDs. In the context of this study, *intervention processes* are defined as the series of therapeutic actions

and steps directed toward remediation of an SSD. These therapeutic actions and steps broadly relate to target selection, selection of a therapy approach, and the structural and procedural aspects of therapy sessions.

Most studies of clinical practice for children with SSDs have provided quantitative data from surveys to explore the *what* of intervention processes used by SLPs without consideration of the *why* or *how*. Interviewing has been suggested as a method for gaining specific, in-depth knowledge about SLPs' clinical practice (Brumbaugh & Smit, 2013; McLeod & Baker, 2014). To the authors' knowledge, this is the first study to use individual interviews to obtain insight into the intervention processes used by SLPs and how these processes are executed within a clinical context.

## Method

### Participants

Participants were selected using a purposive sampling method. This method is commonly used in qualitative research in order to identify participants who can provide a full and sophisticated understanding of the phenomena under investigation. Australian pediatric SLPs, currently working with more than one child with an SSD, were invited to participate. The research participation opportunity was advertised through special interest groups, online speech pathology forums, Speech Pathology Australia's National e-News (an online newsletter distributed electronically by Speech Pathology Australia to all practicing members) and at private practices within a 20-km radius of La Trobe University's Bundoora campus.

A total of 16 participants expressed interest in the research. Two were excluded, as neither was working with a child with an SSD. Signed consent forms were returned by 14 participants; however, three withdrew consent prior to data collection due to work commitments and being unable to organize an interview time. Eleven participants were recruited for the study; 10 of whom were female. To ensure anonymity, all participants have been referred to as female. There was diversity in the sample relating to the location of professional training, represented by four universities across three states (eight of the 11 participants). The location of professional training was not disclosed for three participants. Participant numbers were assigned but are not provided in Table 1 in order to protect the participants' identity. Other participant details are provided in Table 1.

In qualitative research, the aim is not to provide a representative sample but rather to select participants meaningfully and strategically (Carpenter, 2008) to ensure that the sample provides enough data to thoroughly address the research questions (Mason, 2002). In the current study, 11 participants were adequate to achieve data saturation.

### Data Collection, Recording, and Handling

The first author, who is also a pediatric SLP, conducted a single individual interview with each participant between April and June 2016. Interviews occurred at the

**Table 1.** Participant details.

Years of experience	Geographical location	Work setting	SSD proportion of caseload	Additional caseload characteristics
26	MM	Private practice	30%	Literacy, language, families with “complex needs” (AAC, family issues)
26	MM	Private practice and hospital-based pediatric rehabilitation	30%–50%	Pediatric rehabilitation
25	MM	Private practice and community health	Varies (PP) 50% (CH)	
22	MM	Private practice	20%	Diverse caseload: autism, literacy and language
13	MM	University clinic	60%–65%	Preschool language and phonology, school-age literacy
7	MM	School-based service	70%	Childhood apraxia of speech, articulation, phonological impairment
5	MM	Private practice	25%	Autism spectrum disorder and language
4	MM	Private practice and community health	30%–40% (CH) 20% (PP)	< 6;0 (years;months) of age in CH (voice and language) Up to secondary school in PP
3	MM	Community health	70%	18 months to school aged (language, stuttering, voice). Low socioeconomic status, complex family issues
3	RV	Community health	20%–30%	Mixed caseload: predominantly pediatric, low socioeconomic status, and highly complex
2	MS	Private practice	25%	Developmental language disorder

*Note.* SSD = speech sound disorder; MM = Metropolitan Melbourne (this is defined as the geographical area that defines Melbourne as a city and the capital of the state of Victoria); AAC = augmentative and alternative communication; PP = private practice; CH = community health (community health services in Australia deliver a range of primary health services and community-based support to the community; community health services receive funding from a range of programs); RV = Regional Victoria (this encompasses all the areas of the state of Victoria outside Melbourne; Regional Victoria is also known as country Victoria); MS = Metropolitan Sydney (Sydney is the state capital of New South Wales in Australia).

participant’s workplace (five participants), in a quiet room at La Trobe University (four participants), or via Skype (two participants). Interviews ranged in duration from 27 to 58 min, with an average duration of 40 min. Prior to each interview, the first author informed the participant that she was an SLP who regularly practiced in SSDs. None of the participants were personally known to the interviewer. An interview guide (see Appendix A) was used to obtain accounts of participants’ intervention processes and the variables influencing their clinical practice. It served to steer the discussion around three main topics relating to the management of children with SSDs. The interview guide was informed by the research objective and through identification of themes in previous research investigating SLPs’ clinical management of children with SSDs. It was reviewed by two certified practicing speech pathologists of Speech Pathology Australia (third and fourth authors) and revised based on the feedback from these coauthors. The interview guide was not formally piloted. Interviews were audio-recorded and transcribed verbatim by a transcription company. The first author confirmed the accuracy of all transcripts prior to content analysis by listening to the recordings while reading the written transcripts. Ethics approval was granted for this study by La Trobe University’s Human Ethics Committee (SHE CHESC S15/263).

### Data Analysis

The process of inductive content analysis described by Elo and Kyngäs (2008) was used. This is a systematic process that involves identification of categories of data,

from the specific to the general, through collation of similar text (Morse, 2008). Categories determine what is in the data as opposed to a theme, which is a meaningful essence running through the data (Morse, 2008). For this study, analysis began with multiple readings of the transcripts by the first author. The process of inductive content analysis was conducted primarily by the first author using the software program NVivo (Version 11). Open codes were allocated to units of text in the transcripts to describe all aspects of the content (Elo & Kyngäs, 2008). Generic categories were generated to classify or organize the open codes. Generic categories were then ordered into higher level, and main categories were to classify similar information at a broader level (Elo & Kyngäs, 2008). Each main category was named with content-characteristic phrases. This process is shown by the following example relating to target selection. Open codes for target selection included “feelings of success for the child,” “functional targets for the child,” and “impact of target selection on child and family.” A generic category labeled “client or family-centered information” was then generated to classify these open codes. This generic category was ordered into a higher level main category labeled “commonly considered target selection factors.” While the researchers had predetermined topics for discussion within the interviews, the categories themselves were generated from the interview data using the process described.

### Rigor Criteria Employed

Thoroughness and rigor were achieved through member checking of transcripts, use of an audit trail for

transparency of methods and analysis, and use of verbatim quotes from the interview transcripts. Member checking involved sending interview transcripts to participants to provide them with an opportunity to add content, to correct errors or phrasing in the transcripts, and to remove any potentially identifying information. Three of the 11 participants responded by replying through e-mail, and eight participants did not respond. Of the three participants who responded, one requested no changes to their transcript and two requested that potentially identifying information be removed from their transcripts. Triangulation involved coauthor review of transcripts for confirmation of categories (Patton, 2015). One of the three coauthors recoded 25% of the content within four transcripts. No discrepancies in coding requiring resolution were identified. The interviewer acknowledged and discussed her own preconceptions, beliefs, values, and clinical experiences relating to the management of SSDs with two of the three coauthors prior to the commencement of the study. This process of reflexivity was maintained throughout the study during regular meetings with coauthors. A reflexive journal was created within NVivo, which detailed the main author's methodological considerations and reflections relating to the interview data and emerging themes.

## Results

Three main categories were identified that were central to SLPs' intervention processes. These were (a) target selection factors, (b) therapy approaches, and (c) structural and procedural aspects of therapy sessions.

### *Exploring the Three Categories*

#### **Target Selection Factors**

Two approaches dominated participants' selection of initial therapy targets: a developmental approach and the functional or meaningful relevance of the targets to the child and their family. The target selection factors discussed by participants are listed in Table 2, in order of frequency mentioned.

Participants described using a combination of theoretical and client- or family-centered information when selecting targets. Theoretical information included knowledge gained from participants' preservice training, textbooks, journal articles, and professional development events about typical speech development and expected trajectories for mastery of speech sounds and elimination of phonological processes. A client-centered approach to target selection involved consideration of client- and family-centered information, including identification of functional or meaningful words of relevance to the child and their family. With a range of factors and considerations, several participants felt that selecting an initial target could sometimes be challenging:

"It's a real hit and miss, I don't have any specific formula for it" (P2).

"I think the complexity part [complexity approach to target selection] can sometimes, I find it a little bit hard to implement though, because...am I picking the right target?" (P4).

The individual child was an important consideration for these participants when selecting therapy targets. Meaningful or functional targets were highly prioritized, as evidenced by the view of many participants that they may set aside theoretical knowledge to prioritize what is important or most appropriate for the client:

"If the parent comes to me and says "they are not saying this word right" and for that parent, that particular word, is kind of niggling them, then... I'll target that, just because that's what the parent wants" (P10).

Participants also based target selection decisions on a developmental approach:

"...definitely I think maybe going for the developmental approach...sometimes, developmental can just be the easier, sort of way to work through things" (P4).  
"Often with kids, you think of developmentally, what sounds they should have at what age" (P9).

#### **Therapy Approaches**

Participants described using as many as 13 unique therapy approaches. Participants' accounts of these therapy approaches are detailed below. This includes participants' implementation of these approaches, perceived advantages and disadvantages of the various therapy approaches, and their suitability for different subtypes of SSDs.

All 11 participants described using a wide variety of therapy techniques with children with SSDs (see Appendix B). These therapy techniques, in order of frequency mentioned, were the minimal pairs approach (10), traditional articulation approach or hierarchy (10), auditory discrimination (nine), Cued Articulation (nine), Metaphon (six), phonological awareness (six), maximal oppositions (four), multiple oppositions (three), the Nuffield Dyspraxia Programme (three), core vocabulary (two), PROMPT (two), cycles (one), and music-based therapy (one). Participants offered rationales for why they chose to use these different approaches. Rationales were mostly based on their previous clinical experiences:

"You do start to develop your own, sort of clinical intuition in some domains and areas and you make your decisions based on that, what might be most appropriate for this child or what has worked for a child who is similar before" (P4).

The notion of hybrid practice or using a "mixture" (P9) of therapies was openly acknowledged by participants. Many felt that one single approach would not be suitable for the duration of a child's therapy. Participants reported bringing in elements of other approaches or temporarily switching approaches in order to help the child progress:

**Table 2.** Target selection factors.

Target selection factor	No. of participants referencing this factor	Participants' rationale for target selection factor
Meaningful/functional to child	7 of 11	<ul style="list-style-type: none"><li>– Considered to have more impact on communicative participation.</li><li>– The child will be able to produce words that are meaningful to their lives.</li></ul>
Targets to facilitate early success	6 of 11	<ul style="list-style-type: none"><li>– Children with less resilience/self-confidence can experience early success.</li><li>– To make treatment a positive experience/to minimize frustration.</li></ul>
Suppression of early phonological processes and/or mastery of early phonemes	6 of 11	<ul style="list-style-type: none"><li>– The presence of early phonological processes is not age appropriate.</li><li>– Following the developmental progression is easier for the child; it mirrors typical acquisition.</li></ul>
A phoneme/error process that will significantly improve intelligibility	6 of 11	<ul style="list-style-type: none"><li>– The child's speech will become intelligible more quickly.</li></ul>
Consonant clusters or a phoneme/process that will influence other phonemes/processes	4 of 11	<ul style="list-style-type: none"><li>– To facilitate greater system-wide change.</li><li>– Targeting complex targets should correct easier targets indirectly.</li><li>– Progress is quicker when complex targets are chosen.</li></ul>
Phonemes that are stimutable or easy to elicit	3 of 11	<ul style="list-style-type: none"><li>– Children with less resilience/self-confidence can experience early success.</li><li>– To make treatment a positive experience.</li></ul>
Phonemes that are common in Australian English	2 of 11	<ul style="list-style-type: none"><li>– Common targets occur more frequently in everyday language.</li><li>– Selecting these targets may have a greater functional impact in daily life.</li><li>– Low-frequency speech sounds have less impact on intelligibility.</li></ul>
Salient target words/vocabulary or perceptually salient phonemes	2 of 11	<ul style="list-style-type: none"><li>– Target words that the child already knows are easier for the child to learn.</li><li>– Less time is spent teaching the meaning of the target words and more time is spent focusing on the child's production of the words.</li><li>– It is easier for children to hear and contrast perceptually salient phonemes, e.g., long vs. short sounds, voiced vs. voiceless sounds.</li></ul>

“I’ll tend to hybrid-it approach and just pick what I think is going to suit the child” (P7).

“If they’re having trouble making that sound then we might...pop out, out of that minimal pair therapy and we’ll just, “you remember how to make this back sound, put our tongue.” So I’ll do a little bit of that artic...then we’ll jump back in to the minimal pairs” (P1).

The minimal pairs approach emerged as one of the two most commonly used therapy techniques for children with phonologically based SSDs. Many participants referred to the minimal pairs approach as the approach they “use the most” (P1) or as one of their “top ones” (P3). Participants’ preference for the minimal pairs approach is related to their familiarity with the approach, previous success in using it, and ease of its implementation:

“I feel very comfortable using them and I’ve had the success with them [referring to two therapy approaches, the minimal pairs approach and multiple oppositions]” (P1).

“I tried minimal pairs with a lot of these children at the end and it really had a big impact on...their clarity of speech and even the way they engaged in therapy” (P4).

Participants’ comments also reflected their preference for the way in which the minimal pairs approach highlights the impact of loss of meaningful contrasts to a child, described by one participant as:

“Seeing them click cognitively that their speech is affecting someone else’s understanding” (P3).

Nevertheless, many participants acknowledged that the minimal pairs approach could not be used exclusively and described needing to draw on elements of other approaches, such as the concept and phoneme levels of Phase 1 of Metaphon therapy, to establish shared vocabulary and conceptual knowledge in relation to the target sound and its perceptual and articulatory features:

“If I was going for a minimal pair approach, I would start by introducing visual cues...of a snake to represent /s/ for example and pictures of a drum to represent the /d/” (P5).

“That was a really great long...sound” (P2).

There was consensus that, for the minimal pairs approach to be successful, the child needed to be stimutable for the target sound. Establishing production of the isolated target sound, often with a traditional articulation approach, was therefore an initial step in the therapy for many participants:

“I have found it very tough when I’ve tried to do minimal pairs first and the child can’t make that correction or can’t get that sound placement” (P4).

Equally as popular among participants was the traditional articulation approach or the traditional articulation hierarchy. Participants liked its ease of implementation both within the clinic and outside the clinic (i.e., home practice). The well-known, step-wise phonotactic hierarchy of traditional articulation therapy was referred to by all participants as a point of preference. They described using traditional articulation therapy most commonly for children with articulatory-based errors:

“...like a lisp, or like just on /s/ and /z/ or just an /r/ ...and then I go straight artic” (P11).

The traditional articulation approach was more likely to be used in conjunction with minimal pairs than any other therapy approach. All participants described using the initial steps of the hierarchy to develop the child’s awareness and production of the target sound(s) prior to introducing minimal pairs. Once stimulative for the target sound, some participants mentioned use of minimal pairs for production tasks at the establishment and transfer stages of the traditional articulation hierarchy. For example:

“I find I’m doing an artic approach with minimal pairs” (P4).

“...we work on a process, but then within that I do... a very traditional sort of approach” (P8).

Nevertheless, a few participants questioned the effectiveness or efficiency of the traditional articulation approach:

“I try and avoid traditional articulation...because it takes just so long (P1).

Traditional artic is...easier to implement...the effectiveness I don’t think is always there” (P3).

Auditory discrimination, which was mentioned by nine participants, was considered a useful prerequisite prior to sound production tasks. For many participants, the technique was an opportunity to determine whether the child could accurately discriminate between the target and error sounds. Auditory discrimination was often used by participants as an adjunct to their elected therapy approach. At later stages of a child’s therapy, participants described using auditory discrimination as a strategy to support self-monitoring. For example, some participants described making deliberate production errors in their own speech for children to identify and correct:

“...thumbs up or thumbs down?...a big tat...sort of ensuring that they can pick up on when I’ve said something wrong...from there...I get them to... correct my sentence” (P2).

Nine of the 11 participants reported using Cued Articulation alongside other therapies. Participants used this technique frequently, with some describing it as a “reflex” (P5) or as something that is always part of their “toolbox” (P1). The technique was considered beneficial for many reasons. These included helping a child understand the articulatory features of the target sound, as a strategy to support sound production, and as a visual cue to prompt or remind the child about the target sound throughout therapy:

“...you’re giving the child sort of that being able to see what to do” (P6).

For the same reasons, some participants used Cued Articulation as an adjunct to phonologically based approaches as a way of physically gesturing the difference between the target and error/neutralized sounds. There was wide consensus that Cued Articulation “works” (P1), that it is “really useful” (P11), and that it “really helped” (P9). Participants

reflected on how quickly children learn and copy the cues without explicit instruction and that children appeared to enjoy using the cues:

“kids seem to enjoy [it] quite a lot” (P2).

Two participants referred to the use of Metaphon by its formal name. A further four participants described phonological awareness activities that closely resembled the principles of Metaphon. The term *Metaphon* will be used in the following section.

Metaphon was considered useful as a scaffold or as a contingency if a child was struggling to achieve the production task. As a model, principles of Metaphon were considered valuable in establishing a shared vocabulary about the articulatory and perceptual characteristics of target sound(s) in a way that could be easily understood. Participants explained that they introduce the characteristics of the target sound(s) in the initial stages of therapy to describe the manner, place, and voicing features of the child’s target sound(s) for ease of teaching and to support the child’s understanding:

“We talked a lot about long and short sounds as an introductory thing because his language is really good so he understood the concept of long and short” (P3).

“I didn’t hear your kookaburra sound” (P7).

One or more elements of Metaphon therapy were used as models or contingencies throughout therapy, often as a priming technique prior to a production task and for encouraging self-correction by touching a pictorial referent card or holding it up during generalization tasks. Rather than following the two phases of Metaphon systematically, participants typically described employing techniques from the concept and phoneme levels of Phase 1 of Metaphon. This included using activities to familiarize a child with the concepts of “long” and “short” when targeting the phonological process of stopping, “Is that a long sound or a short sound that you made?” (P2), or holding up a visual referent (i.e., pictorial referent card) for the target sound(s) to provide specific feedback to children relating to their speech production accuracy:

“Like you use a visual association...like I use a kookaburra (for /k/)...I didn’t hear your kookaburra sound” (P6).

“...effectiveness in terms of their [parent] feedback to the child specificity-wise is great...she does activities with him all the time about ‘oh let’s stretch that long jelly snake out and make our long sounds’...so it has a number of good effects apart from the way that it sort of works as a therapy, it sort of has off-shoot effectiveness in the parents’ own attitude towards how they respond to a child’s speech sound disorder” (P3).

“You’ve just said this one! Can you make that sound different? Remember, back sound” (P1).

Phonological awareness interventions, including rhyming activities, syllable counting, and the use of “sound bags”

(P7) or word sorting activities, were discussed as frequently as Metaphon, with six of the 11 participants describing use of this approach in their therapy regime. These participants integrated phonological awareness interventions into their existing therapy regime as a stepping stone toward speech production tasks or to complement speech production tasks.

As a stepping stone, phonological awareness tasks were used as an initial step in the therapy program to reduce anxiety for children who are self-conscious about their speech or to prepare younger children for speech production tasks:

“Children who are very self-conscious about their speech sounds...to take the pressure off them actually producing any sounds or words at all...go much more for the listening and the auditory discrimination and phonological awareness work” (P5).

As a complement to the therapy regime, participants incorporated phonological awareness tasks to develop a child’s general awareness of sounds and the sound structure of words and to develop their early literacy skills:

“We’re trying to build in some sound awareness or early literacy phonological awareness skills, then I might build some of that into the articulation therapy” (P7).

Techniques such as multiple oppositions, maximal oppositions, PROMPT, cycles, and core vocabulary were reportedly used far less frequently, and participants described feeling ambivalent or challenged by these:

“I wouldn’t use PROMPT, I don’t like PROMPT” (P5).

“I’ve looked at cycles but it doesn’t really work in our service...so I haven’t tried that one” (P11).

“...maximal oppositions, you don’t get that...sort of lightbulb moment with the child...cos they can see that, you know that’s...homonymy” (P1).

Some commented on the level of analysis and time required to select targets for these therapies. This was true even for participants who regularly used maximal oppositions:

“I spend a lot of time thinking about target words...they’ll [Sound Contrasts in Phonology (SCIP)] come up with all the pairs, ha, all the THREE [laughs]” (P1).

“I’ve frequently tried to do maximal oppositions therapy...I find target selection for that very hard...just finding appropriate pairs...There’s so many times where I’ve gone and got my treatment sets and then never actually utilized them, because I thought they were stupid” (P4).

Lack of use of these therapies also related to the time needed to learn how to implement these approaches or be formally trained in their use:

“I’ve not really dedicated enough time to practice that myself to be feeling comfortable to be able to

train a parent up to do that [regarding maximal oppositions]” (P4).

“So I’ve sort of changed the way I choose my sounds since I’ve done the PROMPT course and all I can do is the parameter prompts, I’m not going to pretend I can use any of them...because I just forgot how to do it when I left the workshop” (P8).

The five therapy approaches listed above, along with the Nuffield Dyspraxia Programme and music-based therapy, were discussed by a small number of participants: maximal oppositions (four), the Nuffield Dyspraxia Programme and multiple oppositions (three), core vocabulary and PROMPT (two), and music-based therapy (one). Most participants were able to provide the rationale for using these approaches and explain their suitability for specific and often complex subtypes of SSDs. For example, the three participants who referred to using the Nuffield Dyspraxia Programme used it with children with “significant motor planning issues” (P5). One of the three participants who used multiple oppositions explained how this approach is used to “reorganize a child’s speech” (P1).

### Structural and Procedural Aspects of Therapy Sessions

The structure of therapy sessions described by most participants followed a predictable format (see Figure 1) comprising a warm-up, therapy, and cool-down segment. For many participants, the warm-up segment consisted of a conversation with the parent and child. This allowed for discussion of the child’s progress since the last session and discussion around home practice tasks that had been completed. It also provided participants with an opportunity to refamiliarize themselves with the child’s speech and listen for generalization of target sounds in connected speech. Following the warm-up segment, the active therapy component of the session occurred. For all participants, the therapy segment of the session focused on one to four goals; however, this was client dependent:

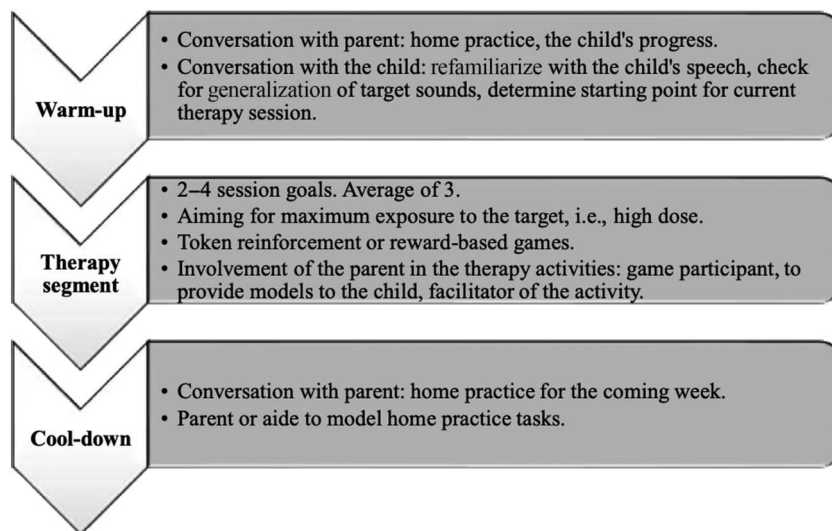
“We usually only have one or two goals because the parents and the aides are doing it I don’t like to, overwhelm them with too many goals” (P11).

“I’m usually trying to target three goals with a five year old. With a three year old we might only have two goals because that’s more sort of what their attention is” (P6).

Therapy goals were targeted within a range of session activities using a variety of different resources. Participants appeared enthusiastic when sharing their preferred resources for therapy. Collectively, a wide range of resources and games were described, including card games (e.g., memory, snap, go fish, hide-and-seek), bingo, board games, token reinforcement games (e.g., Pop-Up-Pirate, Tumbling Monkeys), puppets, and jigsaw puzzles. All participants described the use of token reinforcement in therapy sessions as a way of motivating the child, rewarding their attempts, or providing feedback on the accuracy of their attempts. Several participants explicitly mentioned the importance of



Figure 1. Session structure.



using resources that are transferable to the home practice setting:

“I’ll say to the families do you have a board game like this at home? Or bring in your board game from home and including what they’ve got at home” (P7).

Most participants were enthusiastic about using technology in therapy sessions. Mobile applications (apps) were used by many of these participants, and the computer software program SCIP (Williams, 2006), was used by one participant. This participant described using SCIP because of the number of available therapy exemplars: “I love SCIP... just so many exemplars” (P1). Another participant spoke about how session preparation time was reduced with the use of mobile apps in therapy:

“It means I can concentrate more on what they’re doing and reduces how much manual work that I need to do as well” (P6).

Participants discussed how the use of mobile apps added to the engagement value of therapy. Some participants felt that children were more likely to complete therapy tasks when these were app based. Most agreed that the use of technology in therapy for SSDs was a “real area for the future” (P2) and described how more families were asking for suggestions for mobile apps to support the development of their child’s speech. Participants discussed the potential for mobile apps to increase home practice time and compliance. The accessibility and transportability of mobile apps as a therapy resource was also discussed:

“I have to carry so much stuff [laughs]...it’s easier to have it on this [points to tablet]” (P11).

Nevertheless, alongside the interest in technology, most participants expressed some concerns relating to the use of mobile apps in therapy sessions with children with

SSDs. Some participants reported that there is too much of a reliance on technology:

“Kids already get enough screen time” (P7).

Other participants commented that mobile apps could be distracting and that it is difficult to find a mobile app that was suitably designed to align with their therapy goals and of therapeutic benefit:

“The child wants to do other things on the iPad® so it can be a bit of a battle” (P6).

“It hasn’t got...simple one-syllable words...it’s got kind of a mix of two syllable words and some have even got blends when you’re not working on blends” (P5).

When discussing the therapy segment, participants described the antecedent or stimuli provided by the SLP, the child’s response, and the subsequent reinforcement or feedback provided by the SLP to the child. For the antecedent or stimulus, the most common methods of eliciting the target behavior were through the use of placement cues, visual or tactile imagery, visual or auditory models, prosodic emphasis, and manipulation of the articulators:

“...pure artic I would go into depth about what their tongue should be doing...” (P11).

“Some sort of salient...name...instead of saying the /b/ sound or the /f/ sound...giving it some sort of... something that they can relate to” (P1).

“Will indicate you know physically, on the kid’s mouth, what they might need to do...help push up a lip to achieve a /f/ sound” (P5).

The topic of participants’ strategic use of feedback and reinforcement comprised a large proportion of the interview time. As a group, participants described feedback

in therapy sessions as information relating to the child's performance, which helps the child take the next step toward the therapy goal. They acknowledged that feedback is an essential component of the teaching moment and should be characterized as a positive, accurate, constructive, specific, tailored-to-the-individual, and appropriate within the selected therapy approach. Some participants expressed how their use of feedback was not something they "actively" (P4) thought about, yet many described it as "really important" (P5) and the "absolute key" (P1) in order for children to make progress.

Participants noted that their feedback was a dynamic and evolving process over the course of a child's therapy. In the early stages of therapy, feedback was described as being structured, explicit, immediate, and frequent in order to introduce and teach a skill. Toward the end of therapy, feedback tended to be more incidental, natural, delayed, and less frequent (see Figure 2).

The types of feedback described by participants was somewhat dictated by the therapy approach and could be categorized as pragmatic or linguistic feedback, verbal or visual placement feedback, visual or tactile imagery, requests for self-evaluation or self-correction, recast of the child's attempt, token reinforcement, and general praise for effort and participation. Examples are provided in Table 3 below.

Although feedback was seen as contributing substantially to therapy outcomes, three participants identified limitations in their knowledge around providing productive feedback, and one participant discussed this in relation to the university students that she mentored. These limitations related to instances when children were not responding or seemingly benefitting from the feedback:

"Oh do you want to try that one again?" and they get it wrong again, and you sort of go 'alright, shall we try it again...?'" (P2).

Some participants also conveyed their perceived lack of confidence around the use of feedback and a sense that they had left the university without sufficient knowledge and skills to do so effectively:

"At uni they give you a script pretty much...and say 'this is the words that you need to say'" (P4).

"I feel like I didn't get taught a lot. I feel like...I've looked it up myself or found it out myself" (P11).

"An area that I'm...I'm least confident in" (P2).

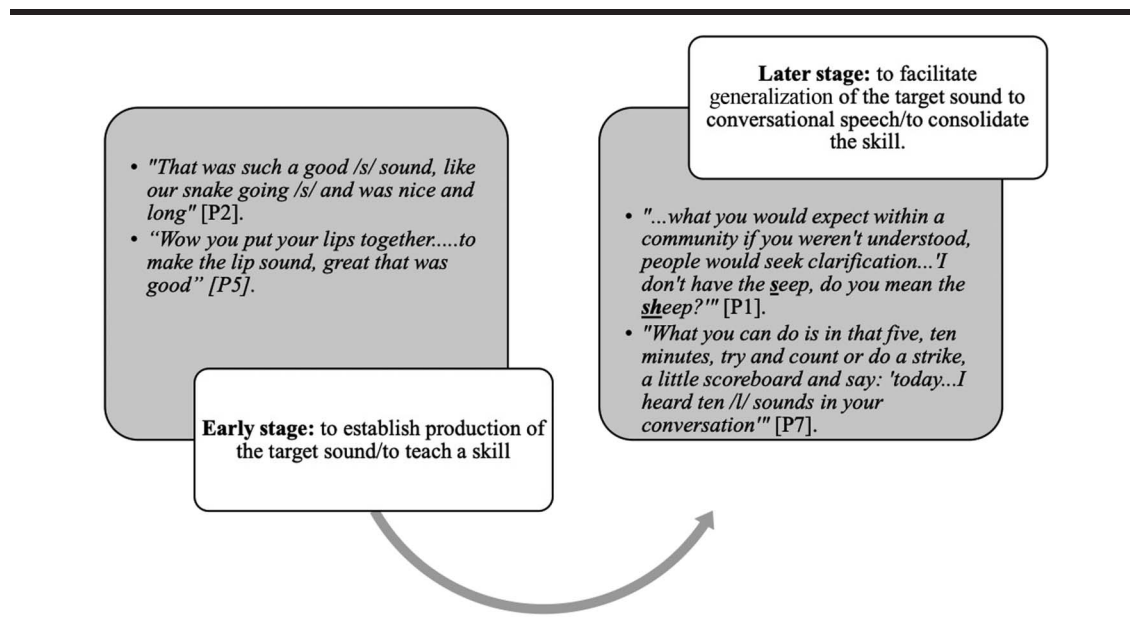
The cool-down segment was described as the final part of a session, typically involving a discussion around home practice and modeling of home practice tasks to parents:

"I will...show the parents what to do obviously or the aide and get them to model it for me" (P11).

## Discussion

EBP is an approach to care that gives equal weight to the best available evidence; professional and clinical expertise; and the client's values, perspectives, and circumstances (American Speech-Language-Hearing Association, n.d.; Erickson et al., 2018). The principles of EBP are recognized as an important part of the delivery of speech therapy services. The external scientific evidence for SSDs has been well considered within the EBP framework; less has been done to privilege the voices of SLPs working in this area of practice (i.e., professional and clinical expertise).

Figure 2. Feedback over the course of therapy.



**Table 3.** Feedback types with examples and/or therapy approaches.

Feedback type	Examples	Associated therapy approach
Pragmatic or linguistic feedback	“I didn’t know that we can open—are you sure you open it with a <u>tea</u> ? I thought we drank a cup of <u>tea</u> ” (P7). “I don’t have the <u>seep</u> . Did you mean the <u>sheep</u> ?” (P1)].	Phonological approaches, for example: <i>When I’m doing minimal pairs, I’m really conscious of just providing more of a pragmatic cue, so you know, “I don’t know what you mean when you say that. Do you mean this or this?”</i> (P4)
Verbal and/or visual placement feedback	“I really liked how your tongue was behind your teeth” (P4). “If you’re working on /f/ and the child can’t get it; you’re like, ‘oh, bite your bottom lip’” (P9).	Traditional articulatory approaches, for example: <i>When I’m doing your traditional artic sort of stuff, it is feedback about the specifics of the sound we are working on</i> (P4).
Visual and/or tactile imagery	“A small, little /s/ snake sound that I might point to” (P5). “I like your long sound,’ if it’s a phonological process or, ‘let’s see if we can stretch that out more’” (P8).	Metaphon approach, for example: <i>The Metaphon approach I’d probably even more using the language we’ve talked about with the sound</i> (P3).
Requests for self-evaluation or self-correction	“I’ll say, ‘how do you think that sounded?’ to try and get that self-correction going” (P11). “Then sometimes I’ll say ‘can you fix it?’” (P7).	All therapy approaches.
Recast of the child’s attempt	“It depends on the kid, you can repeat their error back to them...as another way of feedback...you can’t do that with all kids though because...some get a bit self-conscious” (P5). “I don’t have that seep [when the child meant ‘sheep’]” (P1).	All therapy approaches.
Token reinforcement	“If you hear yourself saying a good sound, you take one, if I hear a mistake, I’m gonna take one [counters]” (P11). “Especially with a five year old, ‘every time I hear a really good sound, I’m going to raise my fingers or I’m going to put a counter in here’” (P6).	All therapy approaches.
General praise for effort and participation	“Really good sitting down” or “good listening, you’ve got your listening ears on” (P2). “Good job!” (P10).	All therapy approaches.

The findings of this study indicate that SLPs prioritize one element of EBP: the client’s values, perspectives, and circumstances. Participants in this study adopt a client-centered approach to management and place substantial value on the individuality of clients. The child was at the forefront when SLPs made decisions relating to target selection, therapy approaches, and therapy session procedures. The SLPs were most likely to choose initial therapy targets based on the developmental approach or functionality. They discussed a wide range of therapy approaches, yet there was no uniformly “right way” (P4) to treat a child with an SSD or a single “gold standard” (P3) approach to management. Valuing the individuality of clients might be driven by SLPs’ knowledge of the social impacts of having an SSD. These include an increased risk of bullying; poor peer relationships; less enjoyment for school (McCormack et al., 2011); feelings of frustration, embarrassment, and sadness about having an SSD (Daniel & McLeod, 2017); and feelings of isolation and confusion as the result of frequent communication breakdowns (Markham et al., 2009).

While SLPs in this study prioritized clients’ values, perspectives, and circumstances as one of the three elements of EBP, they demonstrated opinions and insight about

evidence of therapy targets. This included reference to knowledge gained from preservice training, textbooks, journal articles, and professional development around target selection. Rationales for therapy approaches were mostly based on professional and clinical expertise, which guided their decision making around changing approaches or bringing in elements of other approaches, thus acknowledging the third element of EBP.

Consistent with previous research (Brumbaugh & Smit, 2013; McLeod & Baker, 2014), SLPs in the current study were most likely to choose initial therapy targets based on the developmental approach or functionality. Being guided by a developmental framework for target selection allowed these SLPs to feel confident that the child was well positioned to experience early success in therapy, which in turn could be helpful for their self-esteem (Rvachew & Nowak, 2001). This aligns with a commitment of these SLPs to provide carefully tailored therapy, which meets the needs of each individual child and a collective desire to ensure that therapy is a positive and affirming experience.

A wide range of therapy approaches were discussed by these SLPs, yet few adhered to one specific approach when working with an individual child. Many labeled their practice as “hybrid” or a “mixture” of interventions. The

term *hybrid* has been used previously to describe clinical practice (Brumbaugh & Smit, 2013), along with the term *eclectic* (Brumbaugh & Smit, 2013; Hegarty et al., 2020; McLeod & Baker, 2014; Pascoe et al., 2010). For SLPs in the current study, hybrid interventions switched between or introduced elements of other therapy approaches. A hybrid approach meant having a loose intervention framework in which SLPs could draw on elements from a variety of approaches. Similar to other studies (Brumbaugh & Smit, 2013; Joffe & Pring, 2008; McLeod & Baker, 2014; Pascoe et al., 2010), the SLPs in the current study favored minimal pairs, traditional articulatory approaches, auditory discrimination, Cued Articulation, and phonological awareness. For this group of SLPs, hybrid management provided the opportunity to be flexible and open to change when a child was not responding as expected. Tailoring therapy to meet individual client needs was the primary rationale for hybrid intervention. All SLPs valued a hybrid intervention over and above a single technique.

In this study, a more in-depth understanding of SLPs' attitudes and rationales for choosing various therapy approaches was gained using individual, in-depth interviews. We were able to uncover motivations that appear to be important when SLPs choose therapies. For many, it came down to how familiar they were with the therapy approach, whether they had used it previously and how easy the therapy was to implement. Some described how frequent and continued use of a therapy was influenced by its enduring use within the profession. This has been previously cited as a reason for therapy selection in other domains of speech pathology management. For example, primary therapy choices for dysphagia have been classified as "traditional" therapies of long-term use within the profession (McCurtin & Healy, 2017).

Therapy approaches associated with minimal or low levels of evidence were commonly used by this group of SLPs, with more than half of the participants frequently using the traditional articulation approach, auditory discrimination, and Cued Articulation (Passy, 1986). For this group of SLPs, minimal pairs emerged as one of the most commonly used therapy approaches. This approach has been evaluated in 42 intervention studies, including several randomized controlled trials (Baker & McLeod, 2011). Despite the widespread use of minimal pairs within clinical and research settings, no single therapy approach has been shown to be more superior than another (Baker & McLeod, 2011). Consistent with the findings of McLeod and Baker (2014), therapy approaches associated with higher levels of evidence, such as maximal oppositions, multiple oppositions, and cycles, were used less frequently. The therapies frequently used by these SLPs and their motivations for using these therapies suggest that SLPs prefer to take the "road most often traveled." This may be a familiar and comfortable road; however, taking the road "less" traveled by adopting newer and potentially more efficacious and efficient therapies may yield better outcomes for children with SSDs. SLPs in the current study described the challenges in finding time to keep up with recent advances in management to understand and learn about new therapy approaches, to complete the required

assessment, and to develop the necessary resources needed for their implementation.

Other less-used therapies were those requiring formal training or specific therapy resources (e.g., PROMPT, the Nuffield Dyspraxia Programme). In dysphagia management, McCurtin and Healy (2017) also found that therapies requiring formal training or specialized resources (e.g., technology) were less used among the 116 SLPs in their survey. Lack of knowledge about newer therapies, lack of training, and limited access to these therapies (or therapy resources) accounted for 51% of reasoning for nonuse (McCurtin & Healy, 2017). For children with SSDs, lack of familiarity with newer therapies has also been reported (Brumbaugh & Smit, 2013; Hegarty et al., 2020). Brumbaugh and Smit (2013) identified multiple oppositions, PROMPT, and maximal oppositions to be among the nine least known therapy approaches for SSDs. Other than PROMPT, SLPs' familiarity with newer therapy approaches (developed post-1985) was not related to the number of years since graduation; that is, more recent graduates were no more familiar with newer therapies (Brumbaugh & Smit, 2013). Participants in the study by Hegarty et al. (2020) tended to use long-standing approaches such as minimal pairs and speech discrimination therapy, despite recognizing that newer and more complex approaches could be more appropriate for specific presentations (Hegarty et al., 2020). These combined findings raise questions around how information about newer therapy approaches is obtained and suggest that the uptake of newer therapy approaches into clinical practice may take time, particularly for approaches requiring formal training or specialized resources.

Previous authors have reported only limited use of Metaphon (Brumbaugh & Smit, 2013; Joffe & Pring, 2008; McLeod & Baker, 2014; Pascoe et al., 2010). Nevertheless, this approach or the principles of this approach were used by more than half of our participants. It was regarded as a useful adjunct alongside other therapies to target speech production, primarily as a means of establishing a shared vocabulary between the SLP and the child. None of the participants followed the exact Metaphon procedure as described by Howell and Dean (Dean et al., 1995; Howell & Dean, 1987). The contrasting findings of the current study to previous research, in relation to the use of Metaphon, may relate to the research methodologies utilized. Previous studies investigating SLPs' intervention processes for children with SSDs have been survey based and have provided a list of named therapies without description for SLPs to select from. It is not known how SLPs deliver the therapies they selected or what they believe the essential elements of these therapies to be when only names are provided. SLPs may select named therapies as ones that they routinely used, yet the way in which they delivered those therapies may have differed from how they were prescribed by the creators. SLPs in the current study were asked to describe the therapy approaches they favored or routinely used when working with children with SSDs. Specific therapy approaches were not provided by the interviewer to avoid bias.

These SLPs described a structure to their therapy sessions, which aligned with recommendations in speech pathology textbooks for beginning SLPs (Paul & Cascella, 2014; Roth & Worthington, 2011). Most SLPs appeared to use clinician-directed approaches with children with SSDs, such as drill and drill play (Paul & Cascella, 2014). For some SLPs, these techniques appeared to be chosen in order to provide the child with maximum exposure to the therapy targets. Similar to SLPs in Brumbaugh and Smit's (2013) survey, the SLPs in the current study described using a range of elicitation techniques with children with SSDs, including placement cues, auditory models, and visual/tactile imagery. Labeling speech sounds was common with this group of SLPs and is also consistent with the findings of Brumbaugh and Smit. The SLPs in the current study acknowledged that performance-based feedback is essential or the "absolute key" (P1) within therapeutic interactions for children with SSDs, yet many described limitations in their knowledge surrounding the type, timing, and frequency of feedback. They reflected on the influence of their university and clinical experiences in their understanding and use of feedback.

## Implications for Practice

SLPs may consider how their clinical practice for children with SSDs compares to the findings of this study and to the evidence base relating to best practice. The findings of this study may be validating for SLPs, while also providing them with an opportunity to reflect on their practice and consider ways in which they can continue to develop their knowledge and skill base through attendance at EBP groups, professional development events, workshops, and conferences. To adopt newer, potentially more efficient and efficacious therapy approaches, SLPs may benefit from the development of a freely available clinical guideline or online learning module providing up-to-date, clear, and concise information on evidence-based approaches for SSDs. In order to engage in learning opportunities and skill development, speech-language pathology managers in clinical practice settings should continue to encourage and support their staff to engage with EBP groups, journal clubs, in-service professional development events, mentoring, and staff attendance at workshops and conferences.

For students enrolled in speech pathology programs, these findings highlight some perceived challenges of translating theory into practice. This might support them in understanding their future role as an SLP and the expectations of this role. Evaluation of university syllabi may provide insight into the content that is taught relating to clinical management of SSDs and help determine to what extent SLPs' clinical practice is shaped by university training and clinical placement experiences. Clinical educators may reflect on their own clinical practice with consideration of how this might potentially influence the future clinical practice of their students. Further exploration and consideration of the clinical reasoning behind SLPs' intervention processes might assist

researchers to design and conduct more effectiveness research, which is carried out in a real clinical context.

## Limitations

Sample bias may have arisen given that all participants were Australian SLPs. While a sample size of 11 participants was adequate to achieve data saturation, findings may not be representative of the wider Australian speech pathology workforce. Furthermore, results may not be generalizable given that most participants were working in one state of Australia (Victoria); however, diversity in the sample relating to the location of professional training was achieved.

The findings of previous studies of SLPs' clinical management from the United States (e.g., Brumbaugh & Smit, 2013) and the United Kingdom (e.g., Joffe & Pring, 2008) are reinforcing and present consistent conclusions relating to SLPs' clinical practice in SSDs, particularly around the notion of eclectic or hybrid practice. Furthermore, as an area of speech pathology practice, there is less room for sociocultural differences in the clinical management of SSDs. Therefore, for these reasons, the findings of this current study contribute to a "global" discussion and are believed to have wider relevance to SLPs practicing outside Australia.

Participants in the study did not differentiate between the intervention processes used with English-speaking children and multilingual children nor did they comment specifically on dosage; this may be a limitation of the interview guide that was used. It is acknowledged that selection of therapy targets and approaches for SSDs will differ depending on the nature of the client's difficulties or SSD aetiology. The authors acknowledge that their own experiences and bias can influence interpretation of the data, although attention to potential bias was carefully considered through the process of the audit trail.

## Conclusions

The findings of this study suggest that the child is most likely at the forefront of SLPs' minds when selecting an initial therapy target and therapy approach. Initial therapy targets are selected because they are meaningful or functional to the child in some way and for which the child will be expected to experience early success. The therapy approach is often a combination of elements from four main therapy approaches: minimal pairs, traditional articulatory approaches, auditory discrimination, and Cued Articulation. The therapy is typically dynamic, changing continually throughout the child's journey in order to provide a therapy that is best suited to the individual child, within the context of their family and the wider service in which the therapy is provided.

To advance clinical practice for children with SSDs, SLPs are encouraged to consider the possibilities of the road "less" traveled. To quote Henry Ford, "If you always do what you've always done, you'll always get what you've always got." Is this enough?

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## Appendix A (p. 1 of 2)

### Interview Guide

#### Opening questions

Tell me about your previous and current clinical experience as a Speech-Language Pathologist.  
Current practice site/proportion of children on caseload with SSDs/years since graduation.

#### TOPIC 1: Intervention practices—target selection

1. What factors do you consider when selecting initial treatment targets for children with SSDs?
2. Order of importance/influence?

#### TOPIC 2: Intervention processes

1. What factors do you consider when selecting a treatment approach?
2. Are there particular approaches that you favor or that you employ routinely with clients with SSDs?
3. In your opinion, are some approaches generally more effective than others?
4. Order of importance/influence/use?
5. What are some challenges of working with children with SSDs?
6. What type of technology might you use during a therapy session and why?

#### TOPIC 3: The macrostructure of the session

1. Tell me all that you can about what your typical therapy session looks like.
2. Duration/frequency of therapy sessions.

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## Appendix A (p. 2 of 2)

### Interview Guide

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#### TOPIC 4: Feedback

1. What are your thoughts when you hear the word *feedback*?
  2. Can you describe the models, inputs, and contingencies you typically use with children with SSDs?
  3. How would your use of feedback change as a client progresses in therapy?
  4. In what ways are feedback type and frequency influenced by your elected therapy approach or client?
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## Appendix B

### Description of Named Therapy Approaches and Techniques

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#### Articulatory and motor-based approaches

*Auditory discrimination:* a component of the traditional articulation approach involving identification, location, stimulation, and discrimination of speech sound(s) in different contexts. Also referred to as sensory-perceptual or ear training (Van Riper & Emerick, 1984).

*Cued Articulation:* a hand cueing system that enables visualization of the speech sounds. It was devised by Jane Passy during her work with children with speech and language difficulties (Passy, 1986).

*Nuffield Dyspraxia Programme:* for the management of childhood apraxia of speech or severe SSDs. It is based on a motor skills learning approach with an emphasis on motor programming. It is a “bottom-up” approach in that treatment begins with individual speech sounds and progresses to connected speech (Nuffield Centre Dyspraxia Programme Ltd, 2016).

*PROMPT:* “the clinician provides systematic tactile-kinaesthetic input to inhibit or facilitate movement of the articulators during sound, word, or phrase production” (Grigos et al., 2010, pp. 46–47) to improve sound production in children with SSDs.

*Traditional articulation:* for children with articulation impairments. The focus is on remediating individual speech sounds, which are targeted within a well-known hierarchy: ear training, prepractice instruction, production practice (isolation, syllables, words, sentences), transfer/carryover and maintenance (Van Riper & Emerick, 1984).

#### Phonologically based approaches

*Core vocabulary:* for children with inconsistent speech disorder. This approach aims to establish consistent, developmental approximations of a core set of functional words of relevance to the child (Dodd & Iacano, 1989).

*Cycles:* for children with highly unintelligible speech due to the presence of a number of phonological processes. The aim is to facilitate efficient change in children’s phonological systems by targeting each phonological process for a set period of time before moving to another. The approach is based on eight underlying concepts including amplified auditory input and use of facilitative phonetic contexts (Hodson, 1978).

*Maximal oppositions:* for children with functional phonological impairment and at least six phonemes missing from their phonetic and phonemic inventories. It is a phonological therapy involving maximal contrasts across a number of feature dimensions (e.g., voice, manner, place) with the aim to facilitate greater system-wide change in children’s phonological systems (Gierut, 1989).

*Metaphon:* for children with phonological impairment. The aim of the therapy is to bring about phonological change by developing children’s metaphonological and metacommunication abilities (Dean et al., 1995; Howell & Dean, 1987).

*Minimal pairs:* for children with mild–severe phonological impairment. Paired words differing by a single phoneme are used to confront the child with the homonymy present in their speech. The aim of the therapy is to eliminate this homonymy (Weiner, 1981).

*Multiple oppositions:* for children with severe–profound phonological impairment characterized by multiple collapses of contrast. The aim is to eliminate the homonymy as a result of multiple phoneme collapses by contrasting the child’s errored sound with several other targets (Williams, 2000).

*Phonological awareness:* often provided as a therapy adjunct for children with SSDs. The aim is to support the development of accurate phonological representations of words through teaching of phonological awareness skills such as rhyme, phoneme blending, phoneme segmentation, etc. (Gillon, 2000).

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