RESEARCH STUDY · CLINICAL CONSENSUS

Maximising the Impact of Speech and Language Therapy for Children with Speech Sound Disorder

(MISLToe_SSD – Portugal)

PORTUGUESE TEAM

Marisa Lousada — Speech and Language Therapist & Coordinating Professor with habilitation, RISE-Health, School of Health Sciences, University of Aveiro

Carolina Florêncio — Undergraduate student, School of Health Sciences, University of Aveiro

UK TEAM

Yvonne Wren (Principal Investigator) — Speech and Language Therapist (SLT) & Director of the Bristol Speech and Language Therapy Research Unit (BSLTRU); Reader, Cardiff Metropolitan University; Associate Professor of Speech and Communication, University of Bristol

Joanne Cleland — Speech and Language Therapist (SLT) & Reader, University of Strathclyde

Sam Burr — Speech and Language Therapist (SLT) & Senior Research Associate, BSLTRU

FUNDED BY NIHR | National Institute for Health and Care Research

Contents

Speech Sound Disorder (SSD)

Speech Sound Disorder

Difficulties with the perception, production and phonological awareness of speech sounds — impact on speech intelligibility.

SSD is a term that encompasses subtypes with different characteristics and, consequently, requires distinct intervention approaches.

(McLeod & Baker, 2017; Wren et al., 2018)

Classification systems

Speech Disorder Classification System

- For research purposes

Dodd's Differential Diagnosis System

- Focuses on speech sound disorders of unknown origin

Psycholinguistic Framework

- Useful for planning individualised intervention
- Less suitable in a research context

(Shriberg et al., 2010; Dodd, 2014; Stackhouse & Wells, 1993; Waring & Knight, 2013)

The project in the UK

Project carried out in the UK — "Maximising the Impact of Speech and Language Therapy for children with Speech Sound Disorders (SSD)", to reach a consensus in this area.

Rationale for conducting this study

nbt.nhs.uk/bristol-speech-language-therapy-research-unit/bsltru-research/misltoe-ssd

(Cleland et al., 2025)

In Portugal

- Variability in the terminology and classification of SSDs amongst SLTs
- Variability in the definitions of SSD subtypes
- Variability in the tools and resources used to assess SSDs

↓

Difficulty in planning and analysing the effectiveness of the intervention

↓

Need to reach a consensus on the classification and evaluation of SSDs

Objectives

To reach a consensus on:

the classification of SSDs that reflects current clinical practice in Portugal

definitions for each subtype of SSD that are clinically appropriate for the Portuguese context

the assessment and diagnostic protocol for the different subtypes of SSD

METHOD

Participatory design

Participants

10 SLTs	60% with over 10 years' experience
Gender	100% female
Ages	Average age of 37
Educational institution	4 different institutions
Work setting	Hospital setting (20%) · School/private social care organisation (40%) · Clinical setting (40%)

Informed consent

METHOD

Stages of the study

Phase 1 — Questionnaire

- Which classification systems were being used by the SLTs?
- How are PSF subtypes defined by SLTs?
- Which assessment tools (published or developed locally) are used by SLTs in clinical practice, and how do these lead to the diagnosis of specific subtypes of SSD?

Phase 2 — Workshops

- Workshop 1 · 20 April 2026 · 1h30min each
- Workshop 2 · 18 May 2026 · 1h30min each
    - via Teams

METHOD

Verification, satisfaction and analysis

Data verification

- Email sent to participants 4 weeks after the second workshop

Participant satisfaction

- 5-point Likert scale questionnaire (1. I completely disagree … 5. I completely agree)
- e.g., during the workshop, the facilitators showed a genuine interest in what we had to say as a group

Data analysis

- Mixed-methods approach — quantitative and qualitative (content analysis)

RESULTS

SSD classification system

Phase 1 — Questionnaire

60%
Dodd classification

10%
DSM-5

30%
Generic terms

30% used generic terms (e.g. articulation disorder or phonetic vs. phonological disorder)

PHASE 2 — WORKSHOPS

- It was agreed that, overall, Dodd's classification was the most appropriate for the Portuguese context
- Some amendments were proposed to the definitions of the different subtypes of SSD proposed by Dodd (2014) and the respective adaptations by Cleland et al. (2025) — final consensus

Consensus definitions of the SSD subtypes

Articulation disorder

Substitutions, omissions or distortions of sounds, in isolation and across all phonetic contexts during imitation, elicitation and/or spontaneous speech tasks (e.g. sigmatism) (Dodd, 2014). The child cannot be prompted to produce the sound(s) in isolation and/or within a word. Adapted from Dodd, 2014 and Cleland et al., 2025.

Phonological delay

Presence of (a limited number of) error patterns common in younger children (e.g., devoicing of fricatives; omission of final /l, r/; omission of unstressed syllables). Adapted from Dodd, 2014 and Cleland et al., 2025.

Childhood Speech Apraxia

1) Inconsistent errors in consonants, vowels and diphthongs when repeating the same words, 2) prolonged or interrupted co-articulatory transitions between sounds or syllables, and 3) inappropriate prosody, particularly with regard to word stress or sentence intonation. They frequently exhibit oromotor difficulties (e.g., searching for the place and manner of articulation of sounds; difficulty in sequencing articulatory movements) and perform less well in imitation compared with spontaneous production. Adapted from Dodd (2014) and ASHA (2007).

Consistent phonological disorder

Consistent use of one or more uncommon error patterns from the age of 3 (e.g., posteriorisation, omission of the initial consonant). The child may also exhibit some developmental error patterns that are no longer expected for their age group. Children with a marked lack of phonological contrasts (e.g., using only oral and nasal plosives at age 3) or older children with persistent patterns of delay may be classified as having a consistent phonological disorder. Adapted from Dodd (2014) and Cleland et al., 2025.

Inconsistent phonological disorder

Multiple productions for the same lexical item, without oromotor difficulties (e.g., difficulty locating the place and manner of articulation of sounds; difficulty sequencing articulatory movements), with a criterion of ≥40% for the diagnosis of inconsistency. Children perform better at imitation than at spontaneous production (Dodd, 2014).

Figure 1. Consensus definitions of the subtypes of SSD, with the adaptations underlined in relation to the proposals by Dodd (2014) and Cleland et al. (2025).

RESULTS

Assessment protocol for identifying SSD subtypes

Definition of the information required

To establish a diagnosis — different types of speech samples to be collected

Definition of the tools

To collect this information

Assessment and diagnosis protocol

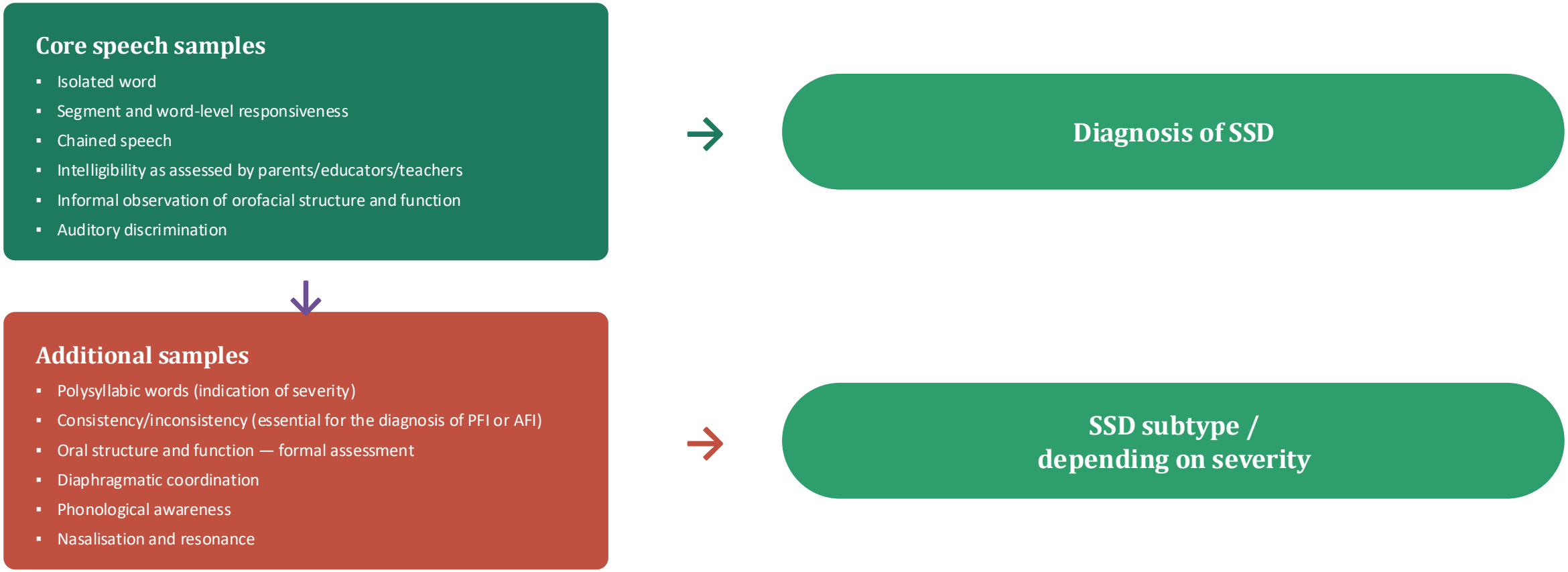

Figure 2 | *Diagram illustrating the assessment and diagnosis protocol. The "Core Speech Samples" (marked in blue) should be administered to all children suspected of having PSF. The "Drill-down Samples" are marked in red.*

Screening protocol

Portuguese version of the Intelligibility in Context Scale (ICS)

Language and Speech Screening (RALF)

(McLeod et al., 2012; Lousada et al., 2019; Lousada et al., 2017)

Instruments and resources for assessing and diagnosing SSD

Instrument/ tools	Screening	Single words	Stimulatability	Connected speech	Intelligibility (parents/ educators)	Inconsistency	Auditory perception	Oral structure, function and diadochokinesis	Nasalisation and resonance	Phonological awareness	Polysyllables	Validation (European Portuguese)	Pre-school	School	Automatic analysis tool
RALF *Lousada et al., 2017*	✓											✓	✓		
ICS *McLeod et al., 2012*	✓				✓							✓	✓		
TFF-ALPE *Lousada et al., 2012*		✓	✓			✓						✓	✓		
Locke Task *Lousada et al., 2023*							✓					✓	✓		
3 Illustrations *Lousada et al., 2014*				✓								✓	✓		
PAOF *Guimarães et al., 2022*								✓				✓	✓		
CLCP-PE *Ramalho et al., 2014*		✓									✓	✓	✓		
TALIE *Capelas, 2025*												✓		✓	
GOS.SP.PASS *Vilarinho & Jesus, in prep.*									✓			*in prep.*	✓		
TL-ALPE *Mendes et al., 2014*										✓		✓	✓		
Phonological Awareness Tasks for Children in the First Cycle of Basic Education *Afonso, 2015*										✓		✓		✓	
FAFA *Saraiva et al., 2017*		✓										✓	✓		✓

Table 1. Consensus-defined instruments and tools for assessing and diagnosing PSF, and the respective tasks they assess.

RESULTS

Participant satisfaction

10 SLTs · Likert scale: 1. I completely disagree … 5. I completely agree

Question	Average
The objectives of the workshop were made clear.	5
The nature and content of the workshop met my expectations.	4.9
During the workshop, the organisers showed a genuine interest in what we had to say as a group.	5
The atmosphere of the workshop was safe and welcoming.	4.9
I found the workshop intellectually stimulating and motivating.	5
I felt comfortable asking questions when I didn't understand something.	4.9

Overall, I would rate this workshop:

● Very poor (0%) ● Poor (0%) ● Acceptable (0%) ● Good (10%) ● Excellent (90%)

DISCUSSION

Screening protocol

Portuguese version of the consensus ICS and RALF

The only validated screening tools for European Portuguese from the age of 3

Quick to complete

ICS — available in several languages and as open access

(McLeod et al., 2012; Lousada et al., 2019; Lousada et al., 2017)

DISCUSSION

Classification of SSDs and definitions of subtypes

Classification

- Consensus on the use of the Dodd classification = UK study (Cleland et al., 2025)

Definitions of subtypes

- Minor changes
- e.g. examples of oromotor difficulties have been added to 'Inconsistent phonological disorder'

In Portugal, as in the UK, **there is consensus on the term "Childhood Apraxia of Speech"**, but using the definition by Dodd (2014) and ASHA (2007).

Assessment / diagnostic protocol

Overall, it is consistent with the UK study (Cleland et al., 2025), **except for the inclusion of auditory perception.**

Limitations

- Small sample size (10 SLTs), although representative of different regions and clinical contexts
- Study focused on SSD of unknown aetiology
- Children with SSD of known cause or concomitant conditions (e.g. DLD) may require different diagnostic approaches

Conclusion

Consensus on the use of the Dodd Classification System and definitions of subtypes

Consensus on a feasible assessment and diagnostic protocol, with a mandatory minimum assessment supplemented by additional assessments to identify the PSF subtype, depending on severity

Dissemination of the study for use by paediatricians nationwide

References

Afonso, C. M. C. (2015). Prosodic complexity: Phonological awareness tasks in children in the first cycle of primary education [PhD thesis, University of Lisbon]. University of Lisbon.

American Speech-Language-Hearing Association. 2007. Childhood Apraxia of Speech. Technical Report. ASHA.

Capelas, S. A. S. (2025). Contributions to the development and validation of a language assessment test for school-age children: Phonological and morphological aspects (PhD thesis, University of Lisbon, Faculty of Arts).

Cleland, J., Burr, S., Harding, S., Stringer, H., & Wren, Y. (2025). Towards an agreed labelling system and protocol for the diagnosis of speech sound disorder subtypes in the United Kingdom. International Journal of Language & Communication Disorders, 60(3), e70052.

Dodd, B. 2014. “Differential Diagnosis of Paediatric Speech Sound Disorders.” Current Developmental Disorders Reports 1, no. 3: 189–196. https://doi.org/10.1007/s40474-014-0017-3.

Guimarães, I., Ascensão, M., & Grilo, M. (2022). PAOF 2: Orofacial Assessment Protocol – Version 2: A contribution to the screening of oral myofunctional disorders in speech therapy. Papa-Letras.

Lousada, M., Jesus, Luis M. T., Hall, A. & Joffe, V. (2014). Intelligibility as a clinical outcome measure following intervention with children with phonologically-based speech sound disorders. International Journal of Language & Communication Disorders, 49(5), 584–601. https://doi.org/10.1111/1460-6984.12095

Lousada, M., Mendes, A. P., Valente, A. R. & Hall, A. (2012). Standardisation of a Phonetic-Phonological Test for European Portuguese Children. Folia Phoniatrica et Logopaedica, 64(3), 151–156. https://doi.org/10.1159/000264712

Lousada, M., Sa-Couto, P., Sutre, D., Figueiredo, C., Fazenda, M., Lousada, M. J. and Valente, A. (2019). Validity and reliability of the Intelligibility in Context Scale – European Portuguese version. Clinical Linguistics & Phonetics. 33(12), 1125–1138. https://doi.org/10.1080/02699206.2019.1589579

Lousada, M., Valente, R. & Mendes, A. (2017). Validation of a Paediatric Speech and Language Screening (RALF). Folia Phoniatrica et Logopaedica. 68(6), 247–251. https://doi.org/10.1159/000479928

References (continued)

McLeod, S., Harrison, L. J., & McCormack, J. (2012). Intelligibility in Context Scale: European Portuguese. (M. Lousada, M. Ramalho, & J. Nascimento, Trans.). Bathurst, NSW, Australia: Charles Sturt University. Retrieved from http://www.csu.edu.au/research/multilingualspeech/ics

McLeod, S., and E. Baker. 2017. Children's Speech: an Evidence-based Approach to Assessment and Intervention. Pearson.

Mendes, A., Lousada, M., Valente, A. & Hall, A. (2014). Validity and Reliability of the European-Portuguese Pre-School Language Assessment – ALPE. Folia Phoniatrica et Logopaedica, 66(3), 89–94. https://doi.org/10.1159/000365354

Ramalho, A.M., Almeida, L., Freitas, M.J. (2014). CLCP-PE: Crosslinguistic Child Phonology Project – European Portuguese. IGAC 67/2014

Saraiva, D., Lousada, Hall, A., & Jesus, L.M. T. (2017). Paediatric Automatic Phonological Analysis Tools (APAT). Logopedics Phoniatrics Vocology, 42(4), 153–159. https://doi.org/10.1080/14015439.2016.1237544.

Shriberg, L. D., M. Fourakis, S. D. Hall, et al. 2010. “Extensions to the Speech Disorders Classification System (SDCS).” Clinical Linguistics & Phonetics 24, no. 10: 795–824. https://doi.org/10.3109/02699206.2010o. 503006.

Stackhouse, J., and B. Wells. 1993. “Psycholinguistic Assessment of Developmental Speech Disorders.” European Journal of Disorders of Communication 28, no. 4: 331–348. https://doi.org/10.3109/13682829309041469.

Vilarinho, H. & Jesus, L. (in prep.). Portuguese version – GOS.SP.PASS

Waring, R., and R. Knight. 2013. “How Should Children With Speech Sound Disorders be Classified? A Review and Critical Evaluation of Current Classification Systems.” International Journal of Language & Communication Disorders 48, no. 1: 25–40. https://doi.org/10.1111/j.1460 6984.2012.00195.x.

Wren, Y., S. Harding, J. Goldbart, and S. Roulstone. 2018. “A Systematic Review and Classification of Interventions for Speech-Sound Disorders in Preschool Children.” International Journal of Language & Communication Disorders 53, no. 3: 446–467. https://doi.org/10.1111/1460-6984o. 12371.