Identification, severity, and impact of speech sound disorders (SSD) in the community

Sharynne McLeod, Ph.D.¹
Linda J. Harrison, Ph.D.¹
Lindy McAllister, Ph.D.²
Jane McCormack¹
¹Charles Sturt University, Australia
²The University of Queensland, Australia

Three main study types describe severity and nature of SSD

- **Clinical studies**
  - Most common (e.g., Dodd & Bradford, 2004)
  - May be biased (only includes children in the clinic)

- **Population studies**
  - Becoming more common (e.g., Shriberg, Tomblin & McSweeny, 1999; McLeod & Harrison, 2009)
  - Typically relies on parent/teacher report
  - Direct assessment focused on language (not speech)

- **Community studies**
  - Rare
  - Reduce bias of clinical sampling
  - Direct assessment can be thorough
Need for non-clinical studies
(Tomblin, 2010, p. 108)

“Much of what we know of these children has come from research on children who have been clinically identified and served. Certainly, by studying those who are being served, our research base is most likely to be relevant to clinical services. However, there is a danger in this research strategy. It is quite possible that not all children with SLI are clinically identified and served within our service delivery systems. In such circumstances, there is the potential for systematic factors to influence which children do or do not find their way to clinical service”


Gap: Need for community study

• To date, there is limited information to describe the severity and nature of SSD in children within the general community
• Relevance of community-based information
  ◦ service planning
    • Do all children who have SSD contact a SLP?
    • Which children do/do not contact an SLP?
  ◦ preventative intervention
    • Can speech intervention include prevention measures?
      • e.g., can children’s reading books emphasize sounds that the majority of children have difficulty producing?
Aims

1. To identify children with speech sound disorders in a community sample of 4- to 5-year-old children
2. To describe the severity and nature of speech sound disorders in children identified by parents and/or teachers with concerns about their speech
3. To examine the impact of speech sound disorders on children’s daily living

Context: Sound Effects Study

• Stage 1: 1,097 children (screening)
• Stage 2: 143 children (direct assessment)
• Stage 3: 13 children + 21 sig. others (interviews)
Stage 1: Sound Effects Study

Method
- Screening questionnaires returned for 1,097 children aged 4- to 5-years-old from 33 childcare centres in 2 Australian states

Results
- Concern about “talking and making speech sounds”
  - Teachers reported concern for 28.8% of 1001 children
  - Parents reported concern for 43.1% of 459 children
- 363 parent and teacher reports could be matched and 77% of these were identical

Stage 2: Sound Effects Study

143 4- to 5-year-old children identified by their teachers and/or parents as having difficulties “talking and making speech sounds”
- None of the children had been diagnosed with cognitive or other developmental disorders
- 109 children’s parents returned case history questionnaire
- The majority (68.8%) had not accessed SLP
  - 24 (22%) received SLP intervention in past 12 months
  - 13 (11.9%) currently receiving SLP intervention
Participant characteristics

- All children spoke English as their first language
  - 10 (9.3%) children were regularly spoken to in a language other than English
  - 5 (4.6%) spoke a language other than English
  - 4 (3.8%) were identified as Indigenous Australians
- Family history of speech, language, literacy, and/or hearing difficulties. Affected family members:
  - 28.4% had brother(s); 14.6% had sister(s); 27.9% had cousin(s); 16.5% had uncle(s); 11.5% had a father; 10.1% had a mother with a history

Instruments

- Speech (Diagnostic Evaluation of Articulation and Phonology, DEAP, Dodd et al., 2002)
- Language (PPVT, Renfrew Action Picture Test, Bus Story)
- Hearing (audiological screening)
- Oro-motor (DEAP)
- Pre-literacy (Preschool and Primary Inventory of Phonological Awareness, PIPA, Dodd, et al., 2000)
- Nonword repetition
- Fluency, voice (AusTOMs, Perry & Skeat, 2004)
- Communication attitudes (KiddyCAT, Vanryckeghem & Brutten, 2007)
- Drawing (Holliday, 2008)
Results: Relational analysis

- 124/143 (86.7%) identified with SSD
  - Using percentage of consonants correct (PCC)
  - Severity index
    - 12 (8.4%) severe
    - 40 (28.0%) moderate-severe
    - 76 (53.1%) mild-moderate
    - 15 (10.5%) mild

Remember: The majority (68.8%) had not accessed SLP.

Results: Consonants and vowels

Percentage of consonants correct (PCC) = 68.1
  - (SD = 14.3; range = 17.9-96.4)
  - Most to least % correct
    - nasals (M = 96.39%; SD = 7.89)
    - stops (M = 89.88%; SD = 15.07)
    - glides (M = 80.94%; SD = 21.29)
    - fricatives (M = 58.54%, SD = 17.40)
    - affricates (M = 58.34%; SD = 36.69)
    - liquids (M = 58.19%; SD = 28.76)
    - consonant clusters (M = 39.97%; SD = 22.50)

Percentage of vowels correct (PVC) = 95.5
  - (SD = 5.2; range = 62.8-100.0)
Results: Consonant accuracy

- Consonants that were consistently correct
  - /w, m, h, ñ, b, n, p, d/
    - Generally consistent with the early 8

- Consonants that were consistently incorrect
  - /θ, ð, ɹ, z, ʃ, s, ʤ, ʧ, j/
    - Generally consistent with the late 8

Results: Lisps

- Interdental lisps /s, z/
  - 19.1% of all /s, z/ consonants (SD = 31.9, range = 0.0-100.0%)
  - Produced by 57 children (39.9%)
    - >40% of the time by 31 children (21.7%)
    - <40% of the time by 26 children (18.2%)

- Dentalization of sibilants /ʃ, ʒ, ʧ, ʤ/
  - Produced by 25 children (17.5%)

- Lateral lisps /s, z, ʃ, ʒ, ʧ, ʤ/
  - Produced by 19 children (13.3%)

- Palatal lisps /s, z/
  - Produced by 9 children (6.3%)
Results: Phonological patterns

- Frequently occurring (present >40% of the time)
  - fricative simplification (n=118, 82.5%)
  - liquid deletion (word-final) (n=113, 79.0%)
  - cluster simplification (n=70, 49.0%)
  - gliding (n=59, 41.3%)
  - cluster reduction (n=28, 19.6%)
  - palatal fronting (n=22, 15.4%)

Intelligibility

Intelligibility in Context Scale (ICS)

- 5 point scale (always-usually-sometimes-rarely-never)
- Most to least understood by
  - parents (M= 4.4; SD = 0.6)
  - immediate family members (M= 4.1; SD = 0.6)
  - teachers (M= 3.9; SD = 0.7)
  - extended family members (M= 3.9; SD = 0.7)
  - child’s friends (M= 3.7; SD = 0.8)
  - other acquaintances (M= 4.0; SD = 0.6)
  - strangers (M= 3.6; SD = 0.8)
Impact of SSD (parent report)\(^{(n = 86)}\)
Factor analysis of 32 items revealed 5 areas of impact (in order from most to least)
1. verbal communication
   - e.g., conversation, speaking
2. advanced learning
   - e.g., learning to read/write
3. applied learning and general tasks
   - e.g., focusing attention, handling stress
4. basic learning
   - e.g., copying, rehearsing
5. interpersonal interactions
   - e.g., relating with strangers, informal social relationships

Conclusions
- These data demonstrate that within a community sample of 4- to 5-year-old children many have significant speech difficulties that impact their lives and would benefit from SLP intervention
  - Children may need articulation (e.g., lisp) as well as phonological intervention
  - Prevention programs could target speech sound production within early childhood centres
Sound Effects Study

- Funding source

- Project officer: Jane McCormack

- Research assistants: Emma Heinrich, Christine Porter, Jacqui Barr, Bethany Toohill, Hannah Wilkin

- Research Institute for Professional Practice, Learning and Education (RIPPLE), Charles Sturt University


References


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