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What do children with speech sound disorder think about their talking?

Jane McCormack, Sharynne McLeod, and Kathryn Crowe

Correspondence to:

Jane McCormack, PhD

Senior Lecturer and Assistant Deputy Head of School
School of Allied Health, Australian Catholic University
PO Box 968, North Sydney, NSW, 2059

AUSTRALIA

Email: jane.mccormack@acu.edu.au

Phone: +61 2 9739 2694

ORCID: 0000-0001-9133-9023

Co authors

Sharynne McLeod, PhD

Professor of Speech and Language Acquisition, Charles Sturt University, Australia

Email: smcleod@csu.edu.au

ORCID: 0000-0002-7279-7851

Kathryn Crowe, PhD

Post-doctoral research fellow, Charles Sturt University, Australia

Email: kcrowe@csu.edu.au

ORCID: 0000-0003-3496-5129

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ABSTRACT

Investigating children's feelings and attitudes towards talking assists speech-language pathologists (SLPs) to understand experiences of communication and the impact of speech sound disorder (SSD). This, in turn, can assist SLPs in identifying appropriate intervention for children with SSD that addresses the needs of children, and their communication partners. This paper draws on data from the Sound Start Study in Australia to explore the attitudes of 132 preschool-aged children with SSD towards talking and the relationship between children's attitudes, speech accuracy, and parent-reported intelligibility and participation. Most of these children with SSD had a positive attitude towards talking. There was a significant relationship between children's attitudes towards talking and speech accuracy. Further, there was a significant relationship between speech accuracy and parents' perceptions of intelligibility and participation. However, there was no significant relationship between children's attitudes and parents' perceptions. These results highlight similarities and differences between attitudes and experiences of preschool-aged children, their performance on clinical measures, and their parents' perspectives, indicating the need for SLPs to consider each of these areas during assessment and intervention.

Learning objectives: After reading this paper, the learner should be able to:

1. Discuss the importance of seeking and understanding children's attitudes towards talking in speech-language pathology contexts.
2. Identify ways that SLPs may obtain children's perspectives.
3. Explain how children's attitudes might differ from the views of parents, and consider the implications for speech-language pathology.

Keywords: speech sound disorder, children, child attitudes, speech-language pathology, participation, ICF

Continuing Education Questions

1. Which of the following international documents recognize the right of individuals to express their views, particularly in decisions that will affect them?
 - a. *Universal Declaration of Human Rights*
 - b. *Convention on the Rights of the Child*
 - c. *Convention on the Rights of Persons with Disabilities*
 - d. *International Covenant on Civil and Political Rights*
 - e. **All of the above**
2. What is the best way to gather the perspectives of children with communication disorders about their own communication experiences?
 - a. Ask their parents
 - b. **Provide them with an alternative means of expression (visual prompts, drawings, binary choice questions)**
 - c. Observe them communicating with others

- d. Ask their early childhood teachers
 - e. Conduct a formal, standardized assessment of their speech and language skills
3. Which of the following measures can be used to explore children's feelings about talking?
- a. **Speech Participation and Activity Assessment – Children**
 - b. Diagnostic Evaluation of Articulation and Phonology
 - c. Focus on Communication Outcomes of children Under Six
 - d. Intelligibility in Context Scale
 - e. Goldman-Fristoe Test of Articulation
4. Based on the results presented in Tables 1 and 2, which of the following statements is NOT true of most (or the greatest proportion of) children?
- a. Children with SSD perceive that talking is difficult and words are hard for them to say
 - b. Children with SSD are generally happy about the way they talk
 - c. Children with SSD are sad when they play alone
 - d. Children with SSD who report they do not like to talk have a lower PCC (speech accuracy) than those who like talking
 - e. **Children with SSD believe people need to help them talk.**
5. How can SLPs use the perspectives of children in clinical practice?
- a. To select motivating targets for intervention
 - b. To choose intervention approaches that support the child and their communication partners
 - c. To understand motivation for engagement in intervention
 - d. To undertake holistic assessments

e. All of the above.

INTRODUCTION

Healthcare delivery in the 21st century emphasizes the individual and encourages autonomy in decisions about health investigations and interventions. In speech-language pathology, consideration of the individual is embedded in an evidence-based approach to practice, and incorporated in professional practice guidelines of associations (e.g., American Speech-Language-Hearing Association, Royal College of Speech and Language Therapists, Speech Pathology Australia). There is widespread recognition within these professional associations that exploring the views, attitudes, and experiences of individuals with a health condition, such as a speech sound disorder (SSD), enables more targeted, motivating, and functional intervention to be planned and provided. Furthermore, it is recognized that investigating the extent to which the condition impacts an individual's ability to undertake everyday activities is an important step towards understanding the condition and the individual's attitude towards it. These practices have been guided, in large part, by the World Health Organization's *International Classification of Functioning, Disability and Health* (ICF)¹ which encourages a holistic approach to providing health services. They also align with other international conventions such as the *Universal Declaration of Human Rights*², *Convention on the Rights of the Child*³, and the *Convention on the Rights of Persons with Disabilities*⁴, all of which emphasize the right of individuals to express their views, particularly in decisions that will affect them.

In recent decades, there has been recognition among researchers of the need to consider the views of children⁵⁻⁸. However, these researchers have also recognised some of the challenges associated with doing so - challenges which might relate to the process (e.g., ethical consent and assent; children's participation in research; appropriate methods for data collection), but sometimes relate more to the product (i.e., accepting and trusting the

children's insights). Children may well perceive the world differently from the adults around them, but this does not make their views less valid or their experiences less real ⁷.

It is typical for speech-language pathologists (SLPs) to gather information from parents (and/or teachers) of children with communication difficulties, rather than the children with communication difficulty themselves. SLPs may seek information from parents and others about children's experiences, the impact of the communication difficulty, and attitudes towards talking. This use of proxy respondents (i.e., parents, teachers and others) when gathering information may be due to perceived challenges associated with obtaining the views of children with communication difficulties; challenges related to the child's age and the nature of their difficulties (e.g., verbal expression), and the lack of importance placed on children's views ^{9,10}. Despite this, children have been found to have the capacity to share their attitudes and experiences, especially when provided with alternative means of expression. For example, in prior research considering children's communication, children's views have been accessed via drawings ¹¹⁻¹⁴, the use of binary-choice questionnaires with yes/no response options ¹⁵, and semi-structured interviews or focus groups ^{12,13,16-18} sometimes supported by a selection of visual prompts (such as faces to colour to express an attitude/emotion) ¹⁹ or illustrations ²⁰. These researchers have provided insights into the views of children with regards to their communication skills, causes of communication breakdown, as well as their responses to those breakdowns. One of the interesting findings to arise from prior research with children with SSD was their attitude towards talking, which was typically positive in the early childhood years, despite parental concerns and SLPs' diagnosis of SSD ^{12,13}.

Given that SLPs typically rely on direct assessment and parental report to determine the presence of SSD, the impact, and the need for intervention, it is worth considering whether (and to what extent) children's attitudes align with these judgments. For instance,

reflecting on how children's attitudes compare with the information we typically gather from others (e.g., parents' perceptions of their talking) might shed some light on the drivers behind attendance and engagement in speech-language pathology sessions as well as outcomes of intervention. Furthermore, reflecting on how children's attitudes compare with the severity of their SSD might reveal at what point (or during which activities) children begin to express negative attitudes towards talking. This could guide the timely selection of functional and motivational intervention goals, which address children's needs, as perceived *by them*.

In this paper, we draw upon data from a large-scale investigation of children with SSD, the Sound Start Study, to explore the following:

1. How do children with SSD feel about talking, and do feelings change when talking in different contexts or to different communication partners?
2. Are children's attitudes towards talking impacted by the accuracy of their speech?
3. What is the relationship between children's attitudes towards talking and parental perceptions of their intelligibility and participation in life activities?

Context: The Sound Start Study

The Sound Start Study ²¹ was a double blind cluster randomized controlled trial to evaluate the effectiveness of a computer-based service compared with typical classroom practices for Australian pre-school-aged children identified with SSD. The study was undertaken in six stages. In stage 1, parents and teachers of preschool children ($n = 1,205$) attending early childhood centres in one major city in Australia completed a questionnaire about their children's development. Children whose parents and/or teachers had identified concerns about how the children "talked and made speech sounds" participated in comprehensive communication assessments during stage 2 ($n = 275$) and stage 3 ($n = 132$). In stage 4, children ($n = 123$) identified with phonological disorders of unknown origin (i.e., not

secondary to hearing loss, oral structural impairments, cognitive impairments and/or developmental delay) were randomized to the experimental or control conditions, and in stages 5 and 6, follow-up assessments were undertaken to determine the immediate and short-term outcomes. The current paper reports data from stage 3, with a particular emphasis on the child report measures that were completed during that stage. Further information about the design, measurement, and outcomes from the Sound Start Study can be found in McLeod et al. ²¹.

METHOD

The Sound Start Study was undertaken with ethical approval from the Charles Sturt University Human Research Ethics Committee (protocol number 2013/070) and NSW Department of Education and Communities State Education Research Applications Process (SERAP) (Approval number 2013267). Consent was gained from the participants' parents/caregivers and assent was gained from the children.

Participants

Children who participated in stage 3 of the Sound Start Study ($n=132$) were aged 48 to 65 months ($M = 55$ months; $SD = 4.27$). There were 83 males (62.9%) and 49 females (37.1%). Most of the children were monolingual English-speakers ($n=108$; 81.8%), with a smaller number of multilingual speakers ($n=24$). The Australian Index of Relative Socioeconomic Advantage and Disadvantage (IRSAD)²² was used to determine family socioeconomic status based on geographical location (postcode). IRSAD provides a measure of socioeconomic advantage and disadvantage along a continuum from 1 = most disadvantaged to 10 = most advantaged in terms of "people's access to material and social resources, and their ability to participate in society" (p. 6)²². For children in stage 3 of the Sound Start Study, the mean IRSAD rating was 7.86 (range 1-10).

Children who participated in Stage 3 of the Sound Start Study had a mean percentage consonants correct (PCC) of 65.6 ($SD = 12.1$, range = 29.1-86.5). All children had also passed hearing and OMA screenings and had non-verbal scores within the normal range, as tested by the PTONI²³. Children's language was described using the Peabody Picture Vocabulary Test (PPVT)²⁴, with these children having a mean standard score of 95.3 ($SD = 14.5$, range = 45-126).

Instruments

Children's feelings and attitudes

The Child Form of the *Speech Participation and Activity Assessment for Children* (SPAA-C; available at <http://www.csu.edu.au/research/multilingual-speech/spaa-c>)¹⁹ was administered to investigate children's feelings about talking in different contexts and with different communication partners. The SPAA-C is an informal measure containing questions for children, parents, teachers, siblings, friends, and significant others. The Child Form is one component of the SPAA-C, containing questions specifically for the child. The SPAA-C Child Form contains 10 items (e.g., How do you feel when you talk to your best friend?) with accompanying visual cues (faces displaying different emotions). For each item, children point to the face that matches the feeling they experience in that context (happy, sad, in the middle), identify an alternative emotion, or select "don't know". They can also respond verbally or by colouring the appropriate face or drawing an alternative emotion (see Table 1). The SPAA-C has been used previously to explore the views of children with SSD and their communication partners in the preschool¹² and school years^{17,25}.

The *Kiddy-Communication and Attitude Test* (KiddyCAT)¹⁵ was administered to investigate children's perceptions of their speech ability and attitudes towards talking. The KiddyCAT is a standardized assessment for children aged 3-6 years, originally designed for

children who stutter. Subsequently, it has been used with a variety of clinical populations including children with SSD ²⁶, children with cleft lip and palate ²⁷, and children who stutter ²⁸. The KiddyCAT comprises 12 items that explore children's attitudes to talking. For six of the items, a "yes" response indicates a negative attitude (e.g., "Is talking hard for you?") and for six items, a "no" response indicates a negative attitude (e.g., "Do you think you talk right?"). The items are randomly organised to avoid response bias.

Speech accuracy (percentage of consonants correct).

The *Diagnostic Evaluation of Articulation and Phonology* (DEAP)²⁹ was administered to assess children's speech production. The DEAP Phonology subtest ²⁹ enabled comprehensive sampling of a broad range of phonemes (consonants, vowels, and consonant clusters) in a range of contexts and syllable shapes and provided normative data for Australian children. Each child's responses to items on the DEAP were entered into the PROPH+ module of Computerized Profiling ³⁰, which calculated the percentage of consonants correct (PCC).

Parent measures of intelligibility and participation

The *Intelligibility in Context Scale* (ICS, available at <http://www.csu.edu.au/research/multilingual-speech/ics>) ³¹ was completed by parents to assess children's intelligibility in seven different contexts: with the parents themselves, immediate family members, extended family members, teachers, friends, acquaintances and strangers. The ICS has been validated and normed for use with Australian preschool children ^{32,33} as well as children from many other countries³⁴.

The *Focus on the Outcomes of Communication Under Six* (FOCUS©)³⁵ was administered to measure children's participation in communicative contexts. The 50-item parent-report measure was used to consider children's function (speech, expressive language,

pragmatics, receptive language/attention) and performance (intelligibility, expressive language, social/play, independence, coping strategies/emotions) and has been validated on 97 preschool-aged children in Canada ³⁶.

Procedure

Two experienced SLPs administered the DEAP, KiddyCAT, and SPAA-C with the children in a quiet room in the early childhood centre that the child attended, with the consent of parents and the assent of children ³⁷. The complete assessments took approximately 30-60 minutes each with breaks available for children who required them. All tasks were video and/or audio recorded using a Panasonic HC-V700 video camera with external Hahnel Mk100 uni-directional microphone and Zoom H1 audio recorder. Online broad phonetic transcription of the DEAP ²⁹ was completed by the assessing SLP and later checked for accuracy based on the audio recording. For further information about the assessment protocol, refer to McLeod et al. ²¹. Parents completed the ICS and FOCUS as part of a caregiver questionnaire.

Reliability

Reliability was calculated based on a randomly selected sample of 30 participants from stage 2 (10.9% of 275 participants). Point-by-point reliability was completed for the DEAP-Phonology speech sample using broad transcription and comprising 6,629 data points. Intra-judge agreement was 91.5% and inter-judge agreement between the two research SLPs was 90.1% reflecting more than “acceptable agreement” according to Shriberg and Lof (p. 255)³⁸.

Analysis

Data from the assessments were analysed in three ways. First, the number and percentage of children who responded with each feeling on the SPAA-C were calculated to

determine how children with SSD feel when talking in different contexts, with different people and in different activities. Similarly, the number and percentage of children who responded yes/no to each item on the KiddyCAT were calculated to determine their attitudes towards talking and perceptions of difficulty. Secondly, the mean PCC score for the children who responded positively or negatively to each KiddyCAT item was calculated and compared using independent t-tests. These tests enabled an examination of the relationship between children's speech skills and their attitudes toward talking. Finally, the relationship between children's attitudes towards talking (total score on the KiddyCAT), parents' reports of intelligibility (ICS), and participation (FOCUS) was examined using Pearson's correlation.

RESULTS

Children's attitudes towards talking

In the current study, the majority of children ($n = 101$, 78.9%) identified that they felt "happy" about the way they talk and feel "happy" when talking to a range of communication partners, including teachers ($n = 91$, 71.7%), parents ($n = 89$, 69.5%), best friends ($n = 80$, 62.5%), and siblings ($n = 76$, 59.4%) (see Table 1). Furthermore, the majority felt "happy" when participating in a range of activities, including when playing with other children ($n = 96$, 75.0%), when teachers ask them a question ($n = 87$, 68.0%), and when talking in front of the whole class ($n = 87$, 68.0%). Playing alone was the item where the largest proportion of children reported feeling "sad" ($n = 57$, 44.5%), rather than happy. Interestingly, children most frequently identified feeling "happy" when not understood by others ($n = 56$, 43.8%), which may reflect the children's lack of recognition of communication breakdown or reflect the way in which others respond (e.g., by taking responsibility for the breakdown).

Similarly, children reported positive attitudes towards talking on the KiddyCAT (see

Table 2). The majority of children responded positively to nine of the twelve KiddyCAT items (see Table 2). However, there were three items to which the majority of children indicated difficulty; These items related to attitudes when words get stuck (Q1) ($n = 67$, 52.3%), when talking is difficult (Q8) ($n = 69$, 53.9%) and when words are hard to say (Q11) ($n = 67$, 52.8%). The total number of negative responses was calculated for each child and compared with normative data provided in the KiddyCAT technical manual. This enabled calculation of the number and percentage of children whose scores were within one standard deviation of the mean (see final row in Table 2). There were 76 (58.9%) children whose scores fell within the expected range for their age (i.e., demonstrated typical/positive attitudes towards talking), and 53 (41.1%) children whose scores fell below the expected range for their age (i.e., demonstrated negative attitudes towards talking).

Children's attitudes and speech accuracy

For the second stage of analysis, a series of independent t -tests was performed to investigate the relationships between the children's speech skills (as measured by PCC) and their attitudes about talking (as measured by the KiddyCAT items). To avoid inflated Type I error, $p = .01$ was set to determine the significance of relationships. As Table 2 indicates, no significant relationship was identified for ten of the twelve items on the KiddyCAT.

However, the DEAP PCC scores of children with positive vs. negative responses were found to differ significantly for two items; these items related to whether children liked to talk (Q9) ($p=0.000$), and whether their own name was hard to say (Q12) ($p=0.007$). That is, children who liked to talk and who did not think that saying their name was difficult had higher PCC scores. The difference between the DEAP PCC and two other items was found to be marginally significant; these items related to whether children felt their parents liked their talking (Q3) ($p=0.019$), and whether children thought they needed help to talk (Q4)

($p=0.013$). In each of the instances, children who responded positively to the KiddyCAT items achieved higher PCC scores than children who responded negatively (see Table 2). That is, children with higher PCC scores tended to think that their parents liked the way they talked and that they needed help to talk.

Children's attitudes and parents' perceptions of intelligibility and participation

For the final stage of analysis, relationships between measures were explored through Pearson's correlation (see Table 3). The correlation between the KiddyCAT and PCC was significant ($p=0.004$). Higher KiddyCAT scores indicate more negative responses (i.e., more negative attitude to talking). Thus, the negative correlation identified here suggests children with more severe SSD (lower PCC) are more likely to have negative attitudes towards talking (higher KiddyCAT score).

A significant positive correlation was identified between both parent measures (the ICS and the FOCUS), suggesting that parents who identified lower levels of intelligibility also identified more restricted participation ($p=0.001$). Significant positive correlations were also found between each parent measure and the measures of children's speech accuracy (PCC): $p=0.002$ (FOCUS) and $p=0.000$ (ICS). This suggests that children with more severe SSD (as determined by PCC scores) were more likely to be identified with lower intelligibility and more restricted participation by parents.

The only correlations that were not significant were between the child measure (KiddyCAT) and the parent measures (ICS and FOCUS). This suggests that children's attitudes to talking did not relate significantly to parental perceptions of intelligibility and participation.

DISCUSSION

The current study adds to a small body of work reporting children's attitudes towards talking and extends this work by examining the association between children's attitudes and their speech skills, and children's attitudes and parent perceptions of their communication.

Children's attitudes towards talking

The current study revealed that most of the children with SSD had positive attitudes towards talking. They liked to talk and generally perceived that they talk well. The positive attitudes expressed by children in this study are consistent with those reported by other researchers in studies investigating children's attitudes toward talking in preschool¹² and the early school years¹³.

However, a small majority of the children in this study still believed that talking was "difficult" and words were "hard to say". This might indicate one of two beliefs: their awareness that talking is a complex activity (one that we do better as we get older), or their recognition of talking as a challenging task for themselves. The first belief would align with the question about talking being difficult (Q8), as this question did not necessarily require children to reflect on their own ability, while the second belief would align with the questions relating to words being hard for them (Q11) and words getting stuck in their mouth (Q1), which both required children to self-reflect. However, there were other questions that also required children to self-reflect on whether talking (Q5) and saying their name was hard (Q12) and the majority of children responded positively to those (64.3% and 54.3% respectively). Due to the different responses across these items, each item was considered separately in the analyses that compared the children's attitudes with their speech skills.

Children's attitudes and speech accuracy

Speech accuracy (as measured by the children's PCC on the DEAP) was significantly associated with two KiddyCAT items (Q9 and Q12). In both instances, children with lower

PCC scores were more likely to respond negatively to the KiddyCAT items. The greatest difference in scores was noted for the item relating to whether children like to talk (Q9). For this item, children who responded “no” had a mean PCC score of 57.0% compared with 67.2% for children who responded “yes”. This was not unexpected, as children with a low PCC may be more likely to have experiences of communication failure and thus negative attitudes towards talking. However, it highlights the importance of providing positive experiences in intervention to encourage and reinforce communicative attempts and build confidence, not just competence, in talking.

Children’s attitudes and parents’ perceptions of intelligibility and participation

The lack of significant correlation between children’s attitudes towards talking and parents’ perceptions of intelligibility and participation is an interesting finding, and parallels the findings of van Doornik and colleagues³⁹ in the Netherlands. It suggests that while parents and teachers may have concerns about children’s communication skills, this does not necessarily correlate with, or lead to, negative attitudes in the children themselves. This difference in attitudes about communication skills reiterates the need for considering multiple perspectives during the assessment process and accessing children’s voices when possible, in addition to the voices of their communication partners. If SLPs fail to include children’s voices, this may have implications for intervention goals and implementation. For instance, children may attend speech-language pathology services without understanding the purpose of their attendance¹³ which could impact their engagement in tasks and progress in intervention.

It is interesting to note that the correlation between speech accuracy (PCC) and the item on the KiddyCAT relating to whether children think parents like how they talk (Q3) was marginally significant. It may be that when a parent perceives that their child is not well

understood by others, they provide assistance or “interpret” their child’s speech for those different communication partners. Over time, this provision of parent help could contribute to the child’s beliefs about their capacity to perform the activity (talking) in a manner that matched their parent’s expectations. There was a trend towards significance between speech accuracy and the children’s responses to the item about whether children need help to talk (Q4). This indicates that some children may consider they need help to talk if they experience more severe SSD, more communication breakdowns, or corrective feedback on their speech performance.

Clinical implications

As with other health disciplines, SLPs aim to incorporate principles of holistic healthcare through investigating the extent to which a condition impacts on an individual’s ability to undertake everyday activities, rather than just the nature of the impairment itself (e.g., see discussion of person-centered focus on functioning; <https://www.asha.org/uploadedFiles/ICF-Speech-Sound-Disorder.pdf>). Increasingly, there is an expectation that, through this process, SLPs explore the views of the individuals themselves, which requires tools that enable these views to be captured. There are currently a number of measures and techniques that enable consideration of the perspective of children about their communication skills ¹⁰.

This study reflects the individual experiences and views of preschool-aged children with SSD. While talking was generally a positive experience for most children, this was not the case for all children, and even when children felt positively about their communication skills, some still acknowledged it was difficult at times. There are a number of clinical implications that can be taken from these findings:

(1) Seeking and accessing children's views should be a component of a holistic speech assessment;

(2) Determining children's attitudes to talking is a first step in developing appropriate intervention goals;

(3) When children have positive attitudes to talking and/or do not perceive issues with their speech, targeting phonological representations and sound contrasts might help show the need for change (i.e., the purpose of intervention) while maintaining a strengths-based, positive approach;

(4) When children have negative attitudes to talking, enhancing the likelihood of successful exchanges through working with communication partners might be an important first step, followed by teaching strategies for self-monitoring and repair.

Limitations

One limitation of the present study was that the feelings and attitudes of children with SSD were not compared with those of typically developing children. Comparison of the responses of these two groups would have allowed for a richer context to understand whether, and how, the attitudes of children with SSD differ from their peers and the association with speech accuracy and parents' perceptions of intelligibility and participation. A second limitation relates to the statistical analysis and interpretation. Given the sample size ($n = 128$), setting a stringent p value ($p < 0.01$) may inflate the Type II error rate, which may fail to detect an effect. Therefore, future research with a larger sample size is important to confirm the findings.

Future research

The findings of the present study open the door to future research in a number of directions. Firstly, triangulation of data to consider consistency of children's responses to

questions about their feelings about their own communication should be considered. While children's responses reflect how they feel at the time they respond to a question, the consistency of responses over a short period of time (e.g., a week) and the triggers influencing their responses could be examined. As part of this, collection of qualitative data to gain examples as to why children have chosen a certain response could be valuable in understanding children's perspectives on their own communication. Such qualitative data could provide a much deeper understanding of the attitudes of children with SSD toward their own communication. Finally, examining the impact of intervention on the attitudes of children with SSD about their own communication would be of value. On one hand, gains in speech intelligibility made through therapy could lead to more positive attitudes towards communication. On the other hand, speech intervention may draw attention to a problem that the child was previously not troubled by and may lead to more negative attitudes.

Conclusion

Investigating and responding to the needs of children is an important practice at all stages of the continuum of care from assessment, through intervention, and discharge. This can be difficult when our clients are young and/or experience barriers to expressing their views (e.g., communication difficulties). This research revealed the different perspectives that can exist among children with SSD and their parents, and so demonstrates the importance of accessing all views to ensure that appropriate intervention targets and approaches are identified, and so that intervention leads to the most meaningful and functional change.

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Table 1. Responses on the Speech Participation and Activity Assessment for Children (SPAA-C ¹⁹) for children with speech sound disorder in the Sound Start Study ($n = 132$)

SPAA-C item relating to children's feelings about...	Happy 	In the middle 	Sad 	Other feeling 	Don't know? 	Valid data
1. The way you talk	101 (78.9%)	7 (5.5%)	9 (7.0%)	2 (1.6%)	9 (7.0%)	128
2. Talking to your best friend	80 (62.5%)	29 (22.7%)	12 (9.4%)	4 (3.1%)	3 (2.3%)	128
3. Talking to your brothers/sisters	76 (59.4%)	6 (4.7%)	33 (25.8%)	8 (6.3%)	5 (3.9%)	128
4. Talking to your mother and father	89 (69.5%)	3 (2.3%)	14 (10.9%)	13 (10/2%)	9 (7.0%)	128
5. Talking to your (pre)school teacher	91 (71.7%)	9 (7.1%)	10 (7.9%)	5 (3.9%)	12 (9.4%)	127
6. Teachers asking you a question	87 (68.0%)	11 (8.6%)	12 (9.4%)	6 (4.7%)	12 (9/4%)	128
7. Talking to the whole class	87 (68.0%)	10 (7.8%)	17 (13.3%)	8 (6.3%)	6 (4.7%)	128
8. Playing with the children at (pre)school	96 (75.0%)	4 (3.1%)	16 (12.5%)	7 (5.5%)	5 (3.9%)	128
9. Playing on your own	54 (42.2%)	8 (6.3%)	57 (44.5%)	6 (4.7%)	3 (2.3%)	128
10. People not understanding what you say	56 (43.8%)	19 (14.8%)	33 (25.8%)	10 (7.8%)	10 (7.8%)	128

Note. Bold denotes the most frequent response for each item. The SPAA-C is available from

<http://www.csu.edu.au/research/multilingual-speech/spaa-c>

Table 2. Responses on the Kiddy-Communication Attitude Test (KiddyCAT¹⁵) and mean percentage of consonants correct (PCC) for children with speech sound disorder in the Sound Start Study ($n = 132$)

KiddyCAT item	Positive response	Yes		No		Valid data	t (p value)
		n (%)	Mean PCC (SD)	n (%)	Mean PCC (SD)		
1. Words get stuck?	No	67 (52.3%)	64.8 (12.6)	61 (47.7%)	66.7(11.4)	128	0.886 (0.377)
2. Talk right?	Yes	102 (79.7%)	66.4 (11.2)	26 (20.3%)	62.3 (14.2)	128	1.581 (0.116)
3. Parents like talking?	Yes	109 (85.8%)	66.5 (11.3)	18 (14.2%)	59.4 (13.9)	127	2.369 (0.019)
4. Need help to talk?	No	57 (44.2%)	62.8 (13.1)	72 (55.8%)	68.0 (10.5)	129	2.519 (0.013)
5. Own talking hard?	No	46 (35.7%)	66.2 (12.0)	83 (64.3%)	65.4 (12.0)	129	-0.378 (0.706)
6. Words come easily?	Yes	101 (78.3%)	66.1 (12.2)	28 (21.7%)	64.5 (11.4)	129	0.624 (0.534)
7. Talk well with everyone?	Yes	106 (82.8%)	66.6 (11.3)	22 (17.2%)	61.5 (14.5)	128	1.814 (0.072)
8. Talking difficult?	No	69 (53.9%)	66.2 (12.1)	59 (46.1%)	65.1 (12.0)	128	-0.536 (0.593)
9. Like to talk?	Yes	110 (85.3%)	67.2 (11.0)	19 (14.7%)	57.0 (13.8)	129	3.603 (0.000)**
10. Others like your talking?	Yes	111 (86.0%)	66.5 (11.6)	18 (14.0%)	61.0 (13.3)	129	1.018 (0.071)
11. Words hard?	No	67 (52.8%)	65.3 (13.9)	60 (47.2%)	65.9 (9.5)	127	0.238 (0.812)
12. Own name hard to say?	No	59 (45.7%)	62.7 (13.8)	70 (54.3%)	68.3 (9.6)	129	2.718 (0.007)*
Total n within 1SD of the mean scores		76 (58.9%)	66.89 (10.99)	53 (41.1%)	64 (13.20)		1.352 (0.179)

* $p < .01$; ** $p < .001$

Table 3. Correlations between children’s speech accuracy (PCC), speech attitudes (KiddyCAT¹⁵) and parent reports of intelligibility (ICS³¹) and participation (FOCUS³⁵)

		PCC	KiddyCAT Total	FOCUS Total	ICS Total
DEAP PCC (<i>n</i> =129)	Pearson Correlation	1			
	Sig. (2-tailed)	-			
KiddyCAT Total (<i>n</i> =129)	Pearson Correlation	-0.249**	1		
	Sig. (2-tailed)	0.004	-		
FOCUS Total (<i>n</i> =103)	Pearson Correlation	0.305**	-0.048	1	
	Sig. (2-tailed)	0.002	0.631	-	
ICS Total (<i>n</i> =129) ^a	Pearson Correlation	.0308**	-0.092	0.313**	1
	Sig. (2-tailed)	0.000	0.298	0.001	-

** Correlation is significant at the 0.01 level (2-tailed)

^a The number of participants in the ICS/FOCUS correlation was 103.

PCC, percentage of consonants correct (based on Diagnostic Evaluation of Articulation and Phonology, Dodd et al., 2002); KiddyCAT, Kiddy Communication Attitude Test (Vanryckeghem & Brutton, 2007); FOCUS, Focus on Outcomes of Communication Under Six (Thomas-Stonell et al., 2012); ICS, Intelligibility in Context Scale (McLeod et al., 2012).