CLINICAL REVIEW

Identifying and managing common childhood language and speech impairments

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Learning to speak is one of life's most important accomplishments. Language, usually acquired so effortlessly, underpins every child's learning and ability to interact with others and to establish relationships. Poor communication has profound implications for employment, health, literacy, parenting the next generation, and social inequalities. It is therefore of great societal concern that language, speech, and fluency disorders are among the most common developmental disorders.

The aim of this clinical review is to summarise the current information on language and speech impairments to help general practitioners, universal well child services, and paediatricians to identify the most common problems, understand their clinical course, decide when to refer and for what services, and understand what improvements can be expected.

Which are the most common language and speech problems?

This review focuses on the three most common preschool problems: language impairment, speech impairment, and disorders of fluency known as stuttering or stammering. Prevalence estimates vary by diagnostic criteria, sampling frame, and age (table 1¹). Table 2² summarises the long term impacts of these conditions based on findings from longitudinal studies.

Language impairment

Language is the ability to understand and use spoken and written words and sentences. Children have language impairment when their ability to understand (receptive) or use (expressive) language falls below age expectations. For example, infants may show limited use of communicative behaviours, such as gaining attention, pointing, and requesting something, whereas toddlers may be slow to say or understand words and phrases. Older children may struggle with one aspect of language (for example, vocabulary, grammatical markers such as plurals or tense, sentence construction) or show more generalised

difficulties. Normal language development is far more variable than previously thought (see section on clinical course).

Speech impairment

Speech, usually mastered by age 8 years, is the process by which the lips and tongue shape vocalisations that convey meaning when combined. Speech impairment is present when children cannot produce individual consonants, vowels, or sound combinations such as fl, str, and shr as expected. Impairments can be so severe that they render children unintelligible even to family members. An articulation disorder occurs when particular sounds are mispronounced (for example, lisping on s and z), whereas a phonological disorder implies failure to understand the rules for a language's sounds (for example, producing the word "tat" for cat or "gog" for dog). The prognosis for delay in learning these rules is good, but using atypical rules—for example, a sound preference substitution error, such as adding an "n" to the beginning of each word—often predicts lasting problems extending to other areas, such as literacy.²³ Cochrane reviews provide information about rare speech impairments such as dyspraxia and dysarthria.^{20 21}

Stuttering

Stuttering disrupts the fluency of speech. Children may repeat sounds, words, or phrases, and prolong speech sounds and hesitations. Blocks occur when a child tries to speak but no sound comes out. Associated non-verbal behaviours include head and mouth movements, blinking, and hand and other body gestures.

What are the causes of language and speech difficulties?

Language and speech impairments share similar risk factors (male sex, family history, low maternal education, social disadvantage)^{2 5} and often co-occur.^{3 4 11 22} Language impairments are also core symptoms of neurodevelopmental disorders (for

The bottom line

- Language, speech, and stuttering impairments are common in childhood and often have debilitating long term social, educational, and health consequences
- These impairments may occur in isolation; however, they are often the first presenting symptom of developmental conditions and as such practitioners should actively seek causes (for example, hearing impairment) and associated problems (for example, learning disability, autism)
- In the first 3-4 years of life, speech and language development varies greatly between normal children
- There is evidence that treatment is effective for speech disorders after 3 years of age
- Treatment is effective for major distressing stuttering that has lasted for more than 12 months
- Treatment can improve difficulties with expressive language that are present beyond 3 years of age, but has little impact on receptive difficulties

Sources and selection criteria

We carried out a search of Medline using the terms “children”, “language”, “speech”, “stuttering” or “stammering” AND “delay”, “disorder”, “impairment”, “treatment”, and “intervention.” We also searched the Cochrane database of systematic reviews using the terms “children”, “language”, “speech”, and “stuttering/stammering”. Incidence and prevalence data were derived from prospective longitudinal cohorts and cross-sectional population studies with direct assessment of children. For intervention studies we considered randomised controlled trials to be the gold standard.

example, autism) and co-occur in conditions such as attention-deficit/hyperactivity disorder at a higher level than could be expected by chance.²² In contrast, the onset of stuttering is associated with higher, rather than lower, maternal education.⁶ Even in population studies with both sufficient sample size and breadth to build comprehensive risk models, much of the preschool variance in all three disorders remains unexplained.¹⁻³ Rapid advances in discovery are anticipated over the coming decade, unraveling the complex genetic, environmental, and neural origins.²³⁻²⁹

What is the clinical course?**Language impairment**

Recent population studies have shown that preschool children not only grow out of language problems (figs 1↓ and 2↓) but may develop them over time.²⁻³⁰ An ideal public health model would incorporate surveillance practices that monitor children’s developmental pathways for language over time along with support services tailored to needs at the right point in the child’s development. Population screening is not, however, recommended because current assessment tools are not sufficiently sensitive or specific to understand which children with low language will resolve naturally or will go on to have persistent problems.³¹

Speech impairment

Speech impairments become apparent during the preschool years when children’s expressive vocabularies rapidly expand and words are combined to form phrases and sentences. Again, different pathways are evident, with changes over time in patterns of speech error types that have differing prognoses and hence intervention needs.⁵⁻³² Children may present with an atypical phonological disorder, which is the most at risk profile for persistent speech disorder and later difficulties with literacy.²² Following intervention the child may demonstrate a delayed rather than disordered phonological profile which has a more positive prognosis—that is, where the child has similar error patterns to a typically developing child but they are simply slower to acquire correct forms. These distinct pathways have differing prognoses and hence intervention needs, requiring assessment by speech therapy and monitoring.³³

Stuttering

Stuttering usually starts between ages 2 and 4 years, coinciding with the explosion in children’s expressive language development at 2 years of age. Onset tends to be sudden, with the repetition of whole words.⁶⁻³³ Severity fluctuates in the first 12 months, with periods of relatively fluent speech followed by more severe stuttering episodes. Although recovery is uncommon in the first 12 months,⁶⁻⁷⁻³³ two thirds of affected children recover naturally within four years.³⁴ Most cases in preschool children are mild and not associated with poorer psychosocial health, language, or non-verbal skills.⁶⁻⁷⁻³⁵

When should referral be made?

A case history, gathered through discussion with the parents, will help inform the need for a referral. Speech and language development should be considered in the context of the child’s broader development, such as social and emotional development, motor skills, play, and cognition. Health professionals can draw on information already known about the child’s development from universal health and development review procedures (in the United Kingdom, knowledge gained by the health visiting teams and the parent retained personal child health record (“red book”) and other professionals involved with the child, such as school staff).

Language and speech difficulties may be the first and only obvious sign of hearing impairment; moderate or greater sensorineural hearing losses may develop or present late even in the era of universal screening of hearing in newborns. However, most children with language or speech difficulties do not have a permanent hearing problem. Therefore an audiological assessment should be carefully considered whenever a child presents with speech and language difficulties or when parents or others express concerns about hearing. Epidemiological studies show that conductive losses from otitis media with effusion (glue ear) do not predict poorer language³⁶ or academic³⁷ outcomes. Decisions about a child’s communication should therefore reflect the language difficulties being experienced, not middle ear disease.

Speech or language impairment is also often the first presenting symptom of other developmental conditions. Therefore practitioners should gather information on the child’s broader development and actively seek advice when causes such as learning disability and autism are suspected.

At present, direct assessment tools are not suitable for use by general practitioners or health visitors with children because they do not have adequate predictive ability and require training in their use. We recommend that primary care providers listen carefully to parents' concerns and select from the range of tools, mainly parent reported. These resources can help the primary healthcare professional to appraise the problem and decide who and when to refer. Exactly what tools to use is often specific to a service or country. Many speech and language therapy services have referral guides and user friendly checklists or progress checkers. Online progress checkers have been developed in the UK for health visitors, general practitioners, and other professionals (for an example see www.talkingpoint.org.uk/gps). Some tools were designed to be completed by parents, such as the child development inventories,³⁸ or by practitioners through direct observation or face to face assessment (for example, the American Academy of Pediatrics policy on developmental surveillance and screening³⁹). Health visiting teams in the UK use the Ages and Stages Questionnaire (ASQ-3) within the universal healthy child programme in children aged 24-30 months, providing baseline information about children's communication and general development.⁴⁰

Language impairment

Until better predictive tools are available, referral in the 0-3 year old age group is an inexact science and in our view should reflect concern from more than one viewpoint (parent, general practitioner, health visitor, pediatrician, preschool setting) in combination with the child not meeting milestones. Children younger than 3 years with low expressive language abilities but otherwise normal development usually do well, with normal language by age 4 years.⁴¹ However, efforts should still be made to ensure that environments are conducive to learning language. These include quality preschool time, providing parents with home based activities to promote language, and, for families with low resources, linkage to broader family support services. The referral pathways we recommend vary by age and presentation. Any one of the following should trigger referral to a speech and language therapist and a child developmental team:

- Low receptive language abilities—for example, children do not understand simple commands appropriate for their developmental stage, such as “where are your shoes” at age 18 months (see progress checkers for examples at ages 1 to 4 years)
- Regression in communication skills, such as loss of words or stopping the use of sentences
- Concern about social communication skills, such as interaction with others.

Beyond 3 years of age, when low expressive language abilities persist or emerge, together with parental concern, we recommend re-administering the Ages and Stages Questionnaire-3 (or similar) and referring for assessment of speech and language therapy where indicated.

After school entry all children presenting with low receptive or expressive language should be referred to a speech and language therapist, as difficulties beyond this age are likely to persist and require intervention.

Speech impairment

Referral to a speech and language therapist should occur when:

- after 3 years of age, a child's speech is not intelligible to unfamiliar listeners or primary caregivers report difficulties understanding their child without contextual support^{42 43}
- difficulties with specific sounds persist beyond the range of typical acquisition (www.talkingpoint.org.uk/gps)
- children are concerned about their difficulties or are experiencing negative social consequences.

Stuttering

Stuttering is usually mild and self resolving. Referral should be made (also see Referral box) when:

- stuttering is considerable and shows no sign of abating 12 months after onset⁷
- there is a family history of stuttering, which increases the family's anxiety
- children are distressed or being teased or bullied.

What treatment can be offered?

Interventions should be delivered in partnership with parents and are determined by the child's speech or language phenotype and needs and based on best evidence. As well as targeting children's communication, intervention should be designed to improve the associated disabling aspects of the disorder, psychosocial and academic opportunities, participation in society, and quality of life. Therapy should be integrated with education and should adapt to the needs of the child throughout childhood.

Language impairment

Evidence from three systematic reviews concludes that expressive language can be improved by using traditional “case based” approaches, where children present to services and receive individualised, impairment focused interventions.^{33 44 45} In the most recent Cochrane review, researchers reported differences between intervention and control children for difficulties with expressive vocabulary (standardised mean difference 0.89, 95% confidence interval 0.21 to 1.56) and expressive syntax interventions to improve sentence construction and use of grammatical markers (1.02, 0.04 to 2.01). None the less, mean expressive abilities did not reach general population means. Both individual and group interventions can be delivered by speech and language therapists or by a range of other practitioners supervised by speech and language therapists. Unfortunately, for receptive language difficulties the treatment effects were much smaller (−0.04, −0.64 to 0.56).⁴⁶ Where difficulties are severe and persistent, intervention is primarily directed towards structuring the learning environment to maximise children's participation and access to the curriculum. The majority of evidence relates to clinically referred populations. Population screening and population level randomised trials in the preschool years have not shown treatment effects for the primary language outcomes.^{47 48}

Speech impairment

Interventions for common phonological and articulation disorders are effective from age 3 years onwards.^{33 49 50} Minimal pairs therapy or sound contrast therapy is appropriate for most phonological disorders⁴⁹ and traditional articulation therapy for most articulation disorders.^{50 51} Given the negative consequences, a “watch and wait” approach is not justified.

Stuttering

Few treatments for stuttering in preschool children have undergone rigorous evaluation. However, in a randomised trial of the Lidcombe programme, a behavioural treatment administered by parents, stuttering was reduced in 77% of intervention children compared with 15% of control children,⁵² with low (16%) five year relapse.⁵³ Delaying treatment for at least a year after onset did not reduce responsiveness^{53 54} and allowed some children to recover naturally. Treatments for stuttering in school aged children seem to be less efficacious.⁵⁵

Preparation of this paper was supported by various granting bodies, including the Victorian's Governments Operational Infrastructure Support Program and the Australian National Health and Medical Research Council, who fund the Centre for Research Excellence in Child Language (No 1023493), as well as a practitioner fellowship for SR (No 1041892), research fellowship for MW (No 1046518), and career development award for AM (No 607315).

Contributors: Each author contributed equally to the preparation of this paper. SR is the guarantor.

Competing interests: We have read and understood the BMJ policy on declaration of interests and declare the following: none.

Provenance and peer review: Not commissioned; externally peer reviewed.

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Cite this as: *BMJ* 2015;350:h2318

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Questions for future research

Can prognostic tools be developed to determine an individual child's risk of adverse communication (speech, language, and stuttering) related outcomes?

Language impairment

Can public health models comprising universal, targeted, and specialist approaches and involving a range of delivery platforms including maternal and child health, general practice, early years settings and schools, and the speech and language therapist be developed to improve long term language outcomes?

What responses are needed to language impairment across the lifespan?

How best can complex, long term language pathways be evaluated in future research?

Speech impairment

What treatments are most effective for children with severe persistent speech disorders?

Stuttering

What treatments are most effective for older children, adolescents, and adults?

What treatments are most effective for children whose speech and language impairments and stuttering are secondary to a range of other conditions such as intellectual disabilities, autism spectrum disorder, or genetic syndromes (such as Down's syndrome)?

Additional educational resources**Resources for healthcare professionals**

Nelson H, Nygren P, Walker M, et al. Screening for speech and language delay in preschool children: systematic evidence review for the US Preventive Services Task Force. *Pediatrics* 2006;117:e298-319—A useful summary of the evidence for and against screening for preschool speech and language delay

Law J, Garrett Z, Nye C. Speech and language therapy interventions for children with primary speech and language delay or disorder. *Cochrane Database Syst Rev* 2010;5:CD004110—A good overview of the evidence for speech and language interventions

Law J, Todd L, Clark J, et al. Early language delays in the UK. Save the Children, 2013. (www.ncl.ac.uk/cflat/news/documents/Lawetal2013EarlyLanguageDelaysintheUK.pdf)—A useful resource to understand the social determinants of speech and language development

Nye C, Vanryckeghem M, Schwartz JB, et al. Behavioral stuttering interventions for children and adolescents: a systematic review and meta-analysis. *J Speech Lang Hear Res* 2013;56:921-32—A good overview and appraisal of the evidence underpinning behavioural interventions for stuttering

Talking point (www.talkingpoint.org.uk/gps)—Excellent online continuing professional development resources for general practitioners

Special Kids in the UK (www.specialkidsintheuk.org/medical/speech-therapy.html)—An excellent set of resources for parents and professionals wanting to understand how a range of developmental problems impact on speech and language development

The RALLI campaign (<http://ralliindex.blogspot.com.au>)—An excellent resource for parents, teachers, and professionals wanting to understand the impact of language impairment. Interviews with parents, teachers, and young people with language impairment are available

Murdoch Childrens Research Institute, Centre for Research Excellence in Child Language. Research snapshot 2 (www.mcric.edu.au/sites/default/files/media/documents/crec_rs2_late-talkers-1_design_v0.1_0.pdf)—Provides an overview of preschool language outcomes for children who were identified to be late talking toddlers

Murdoch Childrens Research Institute, Centre for Research Excellence in Child Language. Research snapshot 3 (www.mcric.edu.au/sites/default/files/media/documents/crec_rs3_late-talking-2_design_v0.1_0.pdf)—Discusses whether intervention for late talking toddlers is necessary and effective

Raising Children Network. Language development: an amazing journey (http://raisingchildren.net.au/articles/language_development.html)—A variety of good resources explaining how language develops

The Royal Children's Hospital Melbourne. Practice brief: promoting bilingual children's communication development (www.rch.org.au/uploadedFiles/Main/Content/ccch/CCCH_Practice_Brief_March2014.pdf)—An excellent snapshot summarising bilingual language development

Resources for parents

I CAN—the children's communication charity (www.ican.org.uk)—Provides a range of support for parents and practitioners, including a free call back service with a speech and language therapist

Afasic. Voice for life (www.afasic.org.uk)—Provides support to parents and represents children and young people with communication needs

The Communication Trust. Every child understood (www.thecommunicationtrust.org.uk)—This coalition of over 50 not for profit organisations works together to assist those who support communication in children and young people in England

British Stammering Association (www.stammering.org)—Provides support, information, and resources for people who stutter

Words for Life (www.wordsforlife.org.uk)—Provides parents with communication milestones from birth to 11 years and activities to encourage their child's communication development

Talking Point (www.talkingpoint.org.uk)—Developed for parents concerned about their child's speech and language development. Parents can benchmark their child's development against milestones and access resources on how to support children with speech, language, and communication needs

Centre for Research Excellence in Child Language (www.mcric.edu.au/research/research-projects/crechildlanguage/)—This international collaboration of language, paediatric, epidemiology, biostatistics, and health economics experts provides accessible research snapshots on factors that affect and improve children's language development

The RALLI campaign (<http://ralliindex.blogspot.com.au>)—Created to "raise awareness of language learning impairments," RALLI provides its own YouTube channel, with videos explaining what language impairment is, the impact it can have, and how to get help

Tips for non-specialists

Below are examples of the types of questions that can be useful to elicit information in the clinical setting. Further details can be found at <http://tinyurl.com/c8xzfo2>.

The nature of the problem

- What difficulties is your child having with speech and communication?
- When did you first become concerned?

- Is he or she able to understand what you and others say to him or her?
- Is he or she aware of these problems? If so, how does that affect him or her (withdrawal, frustration, avoidance)?
- Are some situations more difficult than others (for example, home, kindergarten)?
- Has the problem changed since it was first noticed?

The language environment

- Are languages other than English spoken at home? If so, which ones?
- Does your child speak those languages?
- Does your child understand those languages?
- Which language does your child prefer to speak?
- Which is the main language spoken at home?

Family history

- Has anyone else in your family (in particular parents and siblings) ever had difficulties with speech, communication, language, reading, or writing?

Hearing

- Has your child's hearing been tested?
- Do you have any concerns about your child's hearing?
- Does your child hear you and respond when you call his or her name?
- Does your child react to loud noises?
- Does your child respond to noises in the environment, such as a TV being turned on?

Development of speech and language

- When did your child say his or her first words?
- Did your child babble and play with sounds as a baby (for example, "blowing raspberries", repeating sounds such as bababa or gagaga for fun)?
- Does your child combine words together; if so, at what age did he or she do this?

Child's current speech and language skills

Expressive language (for age appropriate milestones see section below)

- How does your child communicate their needs and interests with you?
- Does your child use gestures and body language like pointing or holding up their arms to be picked up?
- Does your child make sounds which are not recognisable words?
- Does your child use single words (shoe, doggy, up)?
- Does your child combine words (for example, daddy car)?
- Are any of your child's sentences longer than four words?
- Does your child repeat what others say?

Understand spoken language (for age appropriate milestones see section below)

- How well does your child understand what you say to him or her?
- Does your child get or point to common objects when you ask for them (for example, where is the ball, cup, shoe)?
- Does your child follow simple instructions (shut the door, or get your shoes)?
- Does your child respond correctly to yes or no questions?
- Does your child respond correctly to who, what, where, when, and why questions?

Social interaction

- Is your child interested in other children and adults?
- Does your child enjoy interactive games such as peek-a-boo or round and round the garden?
- Does your child make eye contact with you when playing these games?
- Does your child enjoy playing with others?
- Is your child willing to try new activities?
- Is your child happy to separate from you?
- How would you describe your child's temperament?
- How would you describe your child's attention and concentration?

Speech fluency

- Does your child ever repeat sounds or words or "get stuck" on a sound or word?

Speech intelligibility

- Is your child understood by family members?
- Are you or your child aware of or concerned about speech difficulties?
- Does your child have problems saying particular sounds? If so, which ones?

Age at which 90% of British children have acquired sound (using international phonetic alphabet symbols)

3 years to 3 years 5 months

- p, b, t, d, k, g
- m, n, ŋ
- f, v, s, z, h

- w, j (for example, y in yell), l

3 years 6 months to -3 years 11 months

- tʃ (for example, ch in chicken)

4 years to 4 years 5 months

- ʃ (for example, s in measure)
- dʒ (for example, dge in bridge)

5 years to 5 years 5 months

- ʃ (for example, sh in shirt)

6 years to 6 years 5 months

- ʒ (for example, r in car)

7 years or more

- θ (for example, th in bath), ð (for example, th in feather)

Checking milestones

Publicly available checklists and tools are available to enable parents or professionals to compare a child's speech and language development with milestones. The progress checkers present parents and professionals with a series of questions or statements to which they respond yes or no (www.talkingpoint.org.uk/gps). The following are single items from the progress checkers for three ages:

- 1 year old: My baby turns and looks at my face when called by his/her name
- 2 year old: My child can follow and respond to simple commands without gesture, such as find your teddy
- 3 year old: My child understands instructions with about four main words—for example, put teddy in the box, or find a big red ball

After completing the progress checker, parents are provided with advice about the next steps. For example, parents might be told: "You have answered 'yes' to some important questions about your child's communication skills. This means that things are developing well at the moment." Alternatively, parents might receive the following response when key milestones are not being met: "You have answered 'no' to some important questions about your child's communication skills. It is important to talk to someone about your child's communication". The parent or professional is then directed to the resource section on the website that provides details about local services, and is also advised to keep using the checker periodically to monitor their child's progress.

Tips for assessing children in clinic

- In the preschool years, children's speech and language is best observed during free play with age appropriate toys and preferably while interacting with a familiar adult
- Short clinical consultations are unlikely to be conducive to gaining a representative view of a young child's abilities; however, they can be used to make observations about how the parent interacts with and communicates with the child and how the child responds
- Gathering information from parents or carers and other professionals who interact with the child regularly is the ideal way to gather information that can then be used to inform the referral decision

Referral

When concern is expressed about a child's hearing and the child is experiencing speech or language difficulties then a referral should be made for audiological assessment to rule out any hearing impairment.

Language impairments—before the age of 3 years, the prognosis is favourable if problems are with expressive language only and there are no broader developmental concerns.³⁷ If a child is not meeting recognised milestones in expressive or receptive language, or both, after the age of 3 years and concern is expressed by both a parent and a health professional then referral to a speech language therapist is recommended

Speech impairments—speech difficulties characterised by errors typical of a younger child (delay) tend to resolve. In contrast, speech difficulties characterised by atypical error patterns (disorder) tend to persist. Children who are unintelligible to parents after 3 years of age should be referred to a speech and language therapist

Stuttering—more than 10% of preschoolers stutter at least occasionally for a year or more, most without apparent ill effect. The Lidcombe programme is effective for the small number of preschool children with major stuttering that persists for more than 12 months or causes anxiety in the family or distress of the child

Bilingualism—children who are learning more than one language are at risk of both under-identification and over-identification of speech and language difficulties. For appropriate decisions about referral, speech and language development should be considered in all languages spoken by the child.³⁸ This will require the assistance of interpreters able to take a case history in the parent's language and observation of the child interacting

Surveillance and advice when referral is not made

- Health professionals should retain an open door for further advice if parents continue to have concerns
- Parents should be encouraged to use the resources listed in the "Information for parents" and "Tips for non-specialists" boxes and to enroll their child in preschool education
- Referral should be offered where problems persist after 6-12 months or when parental concern continues. Speech and language therapy services in the UK operate an open referral system and so parents could also self refer to their local services in the event of persisting difficulties

Tables

What emerging identification and treatment options are there?

The Centre for Research Excellence in Child language is developing brief prognostic communication tools to support a variety of health professionals to identify children with differing levels of risk for language, speech, and stuttering (www.mcrl.edu.au/research/research-projects/crechildlanguage/)

SCALES is a large UK based population study that aims to identify how many children in the UK start school with major language learning needs (www.scalestudy.co.uk)

Examples of new language promotion programmes currently being tested include:

Talk of the town (www.thecommunicationtrust.org.uk/projects/talk-of-the-town/)

Right @ Home (www.aracy.org.au/projects/righthome)

Early home learning study (www.parentingrc.org.au/index.php/creating-knowledge/making-a-difference-in-the-early-years/early-home-learning-study)

Table 1 | Prevalence/cumulative incidence estimates for speech and language impairments and stuttering in population ascertained samples using direct standardised validated assessment measures

Study	Diagnostic term	Age (years)	Total No	% with condition
Tomblin et al ¹	Specific language impairment	6	7217	7.2
Reilly et al ²	Low language	4	1596	20.6
Beitchman et al ³	Language disorder	5	1655	8.0
Shriberg et al ⁴	Speech delay	6	1328	3.8
Beitchman et al ³	Speech disorder	5	1655	6.4
Eadie et al ⁵	Speech disorder	4	1494	3.4
Reilly et al ⁶	Stuttering	3	1619	8.5
Reilly et al ⁷	Stuttering	4	1619	11.2
Proctor et al ⁸	Stuttering	2-5	3164	2.5
Mansson ⁹	Stuttering	3-5	1021	5.0
Andrews and Harris ¹⁰	Stuttering	0-15	1142	5.0

Table 2| Known impacts of and consequences associated with persistent language and speech impairment and stuttering

Impact and consequence	Speech ^{*11-13}	Language ^{11, 14-16}	Stuttering ¹⁷⁻²¹
Academic:			
Poor readiness for school	Yes	Yes	—
Poor knowledge of letter sounds	Yes	Yes	—
Poor phonological awareness	Yes	Yes	—
Learning problems (spelling, reading, maths)	—	Yes	—
Social and emotional development:			
Increased teasing and bullying	Yes	—	Yes
Difficulties forming relationships with peers	Yes	Yes	Yes
Mental health:			
Poor psychosocial adjustment in adulthood	—	Yes	Yes
Increased anxiety and social phobia	—	—	Yes
Increased suicidal thoughts and truancy	—	—	Yes
Employment:			
Lower literacy	—	Yes	—
Reduced quality of life	—	Yes	Yes
Occupational underachievement	—	Yes	Yes

*High relative risk of later reading difficulties (4.6-8.9) when there are comorbid impairments of speech and language.²²

Figures

Fig 1 Trajectories of 2 year old late talkers

Fig 2 Mean standardised communication or language score at each age by latent class. Adapted from Ukoumunne et al³¹