

Dorothy Bishop: Understanding specific language impairment

SUMMARY

Professor Dorothy Bishop, a Wellcome Trust Principal Research Fellow at the University of Oxford, is investigating specific language impairment – problems with learning words, making the correct sounds, or producing or understanding complex sentences, affecting about 4 per cent of children. She has identified several different types of specific language impairment, and has found that subtle problems, such as poor short-term memory for word sounds, underpin some of these disorders. Her research has improved diagnosis and treatment of children who have language difficulties.



Background

All parents look forward to when their children begin talking. Once the infant's babble has been replaced by language, the child's vocabulary and grasp of grammar develop in a clear sequence. Further language skills are gained as the child begins to learn how to read. Problems in any part of this development can have repercussions during school years and into adulthood.

Disorders of spoken language can involve a range of problems such as very slow language development and poor understanding of long and complex sentences – these can affect up to 7 per cent of children in early school years. In some cases, they are due to a physical problem such as hearing loss; in others the delay is short and children catch up quickly with their peers. But about 4 per cent of children have a specific impairment that has no physical cause but requires clinical attention.

These language impairments take several different forms. Some children have problems with making the correct sounds, others with classifying speech sounds (not recognising that 'pat' and 'potato' begin with the same sound, for example) or get sounds in the wrong sequence. Grammar can also pose problems: some children aged six or seven talk in a babyish way, using short, ungrammatical sentences such as "yesterday I go to school".

Professor Dorothy Bishop, a Wellcome Trust Principal Research Fellow at the University of Oxford's Department of Experimental Psychology, has been investigating this complex group of deficits and their many associated risk factors and syndromes. Using a wide range of techniques – including experimental psychology, electrophysiology, genetics and language assessment – she is working to characterise the disorders and understand their origins.

Advance

Professor Bishop has found that most children with specific language impairment have several underlying problems. The picture emerging is that there are multiple risk factors for specific language impairment that do not cause problems if they occur alone, but in combination with other deficits they do. For example, electrophysiological studies have found that some children show unusually rapid decay of memory for incoming sounds. This is also found in the parents, even if they have no language difficulties themselves. Impairment results when this poor short-term memory is combined with other traits such as poor discrimination of word sounds.

In studies on twins and the parents of children with specific language impairment, Professor Bishop has shown that some aspects of the disorder – such as impaired short-term memory for speech sounds – are heritable. In order to identify the genes that contribute, there must be accurate ways of selecting groups of children to study. Using behavioural genetics Professor Bishop has identified markers of family risk for specific language impairment such as the inability to repeat nonsense words. These markers appear to have distinct genetic origins and can be used to select groups of children for targeted gene studies.

Language problems are also seen as part of broader syndromes such as autism, cerebral palsy and Down's syndrome. Professor Bishop has found it informative to compare the types of language difficulty seen in different conditions. She has, for example, found that children with Down's syndrome and children with specific language impairment share some communication deficits. She has also found differences in the brain responses to speech of children with Down's syndrome that could underlie some of their language deficits.

How it's making a difference

Although many cases of specific language delay, if left, will resolve spontaneously, others are potentially very disabling. Professor Bishop's identification of behavioural markers for families with specific language impairment has helped the accurate, early diagnosis of children who are late in talking to distinguish between 'late bloomers' and those likely to have persisting problems.

One question of great concern to parents is what impact a language impairment will have through childhood and into adult life. Professor Bishop has been studying the adult outcome of children with early language difficulties, and has found different outcomes with different types of language difficulty. This work has shown that some school-aged children with clinically significant language difficulties will go on to live independently and hold down jobs, but that persisting literacy difficulties are often a serious problem. For some children, problems with social interaction become more evident as they grow older, suggesting continuities between language impairment and autistic disorder.

Research in this area is often hampered by lack of suitable measures. Professor Bishop has led the development of language assessments that can pinpoint specific areas of difficulty and be used across a wide age range.

Next steps

Professor Bishop is particularly interested in understanding more about why some children find language learning so difficult. She plans to look in detail at the process of learning as it occurs, to see whether it is possible to develop methods to improve short-term memory for word sounds and to learn the significance of word order in a sentence. This research will be integrated with her studies of brain activity to understand better the neurobiological basis of language learning and language impairment and to develop scientifically informed interventions.

Finally, Professor Bishop aims to look at the occurrences of language impairment with other developmental disorders, such as autistic disorder, dyslexia and developmental dysphasia. Although these are typically treated as separate conditions, they frequently occur together. The reasons for this are poorly understood. She will use twin studies to investigate the genetic and environmental causes of language problems and associated literacy, motor and social skills.

References

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Timeline of Dorothy Bishop

