Encyclopedia on Early Childhood Development

Language development and literacy

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Synthesis on language development and literacy

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How Important Is It?

Learning to talk is one of the most visible and important achievements of early childhood. New language tools mean new opportunities for social understanding, for learning about the world, for sharing experience, pleasures and needs. Then, in the first three years of school, children take another big step in language development as they learn to read. Although these two domains are distinct, they are also related. Early-language skills have been linked to later successful reading. As well, literacy and pre-literacy activities can help further children's language competencies in both the preschool years and later schooling.

Children with poor listening and speaking skills are referred to as having a language impairment. An estimated 8 to 12% of preschool children and 12% of children entering school in Canada and the U.S. have some form of language impairment. Studies also show that 25 to 90% of children with language impairment experience reading disorder, usually defined as poor reading achievement occurring after sufficient opportunity to learn to read. Reading disorder among school-aged children is estimated to be between 10 and 18%.

When children have difficulty understanding others and expressing themselves, it is not surprising that psychosocial and emotional adjustment problems ensue. Children with delayed or disordered language are therefore at increased risk for social, emotional and behavioural problems. As well, research shows that most children who have poor reading skills at the end of Grade One will continue to experience difficulties reading later on.

What Do We Know?

While the nature of the mental activity that underlies language learning is widely debated, there is considerable agreement that the course of language development is influenced by determining factors in at least five fields: social, perceptual, cognitive processing, conceptual and linguistic. As well, although individual differences among children do exist, language development has predictable sequences. Most children begin speaking during their second year, and by age two are likely to know at least 50 words and are able to combine them in short phrases. By age four to six, most children understand the idea of a sentence.

The amount and kind of language stimulation at home and family stresses such as child abuse contribute to children's language development. As well, the quality of interaction between a caregiver and a child – such as when playing word games or

reading books – plays an important role in literacy outcomes. Children's skills progress more quickly and readily in instructional interactions characterized by sensitive, responsive and non-controlling adult input. Other aspects of parental behaviors, such as frequent and regular participation to learning activities and the provision of age-appropriate learning materials, favour the child's literacy outcomes.

Children with impaired language development are at greater risk for later behavioural problems, academic difficulties, learning disabilities and anxiety disorders. The most common behavioural problem is Attention Deficit Hyperactivity Disorder (ADHD); studies also show high rates of internalizing problems such as shyness and anxiety. Children with speech impairments are more likely to have difficulty with phonological processing, phonological learning and literacy.

Phonemic awareness refers to the ability to identify, compare and manipulate the smallest units of spoken words, phonemes. Phonemic awareness and vocabulary skills are, respectively, the best predictors of reading and reading comprehension. Some children are sufficiently competent in listening and talking, but have poor phonological processing abilities. At school entry, these children may be viewed as being at risk for reading disorder.

Finally, there is a markedly disproportionate representation of children who are poor and who belong to ethnic or racial minorities among those who struggle with reading.

What Can Be Done?

Early language interventions during infancy or the preschool years can have a significant impact on child outcomes. There are at least four general contexts in which language intervention can be provided: individual, small group, classroom and caregiver training. Four language-teaching strategies have been demonstrated to improve children's language abilities. These are: *prelinguistic milieu teaching*, to help children make the transition from pre-intentional to intentional communication; *milieu teaching*, which consists of specific techniques embedded within a child's ongoing activities and interactions; *responsive interaction*, which involves teaching caregivers to be highly responsive to the child's communication attempts; and *direct teaching*, characterized by prompting, reinforcing and giving immediate feedback on grammar or vocabulary within highly structured sessions. In all cases, it is important to set the stage for language learning by creating opportunities for communication, following the child's lead, and building and establishing social routines.

In parent-administered language interventions, parents are trained by speech-language pathologists to become the primary intervention agents, learning how to facilitate their children's language development in daily, naturalistic contexts. (This differs from parent involvement, in which children receive direct attention from the speech-language pathologist and parents play a secondary but supportive role.) Parent-administered interventions have yielded short-term developmental progress in communication and language skills in a wide range of preschool-aged children with delayed or disordered language. However, little is known about the long-term effects of this cost-effective intervention model.

Social-policy initiatives should focus on early identification, comprehensive assessments and providing highly responsive environments early on. As well, appropriate training and continuing education should be provided to everyone who works with children and their families, such as speech-language pathologists, early

interventionists, early childhood educators and child-care providers. Yet there are still several barriers to overcome. These include developing more sensitive screening measures to identify the various kinds of impairments, achieving consensus on case definition, and enhancing parent recognition of children's potential problems and the need to seek help.

Factors that Influence Language Development

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Topic
Language development and literacy

Introduction
Learning to talk is one of the most visible and important achievements of early childhood. In a matter of months, and without explicit teaching, toddlers move from hesitant single words to fluent sentences, and from a small vocabulary to one that is growing by six new words a day. New language tools mean new opportunities for social understanding, for learning about the world, and for sharing experiences, pleasures and needs.

Subject
The nature of language knowledge
Language development is even more impressive when we consider the nature of what is learned. It may seem that children merely need to remember what they hear and repeat it at some later time. But as Chomsky[1] pointed out so many years ago, if this were the essence of language learning, we would not be successful communicators. Verbal communication requires productivity, i.e. the ability to create an infinite number of utterances we have never heard before. This endless novelty requires that some aspects of language knowledge be abstract. Ultimately, "rules" for combining words cannot be rules about particular words, but must be rules about *classes* of words such as nouns, verbs or prepositions. Once these abstract blueprints are available, the speaker can fill the "slots" in a sentence with the words that best convey the message of the moment. Chomsky's key point was that since abstractions cannot ever be directly experienced, they must emerge from the child's own mental activity while listening to speech.

Problems and Context
The debate
The nature of the mental activity that underlies language learning is widely debated among child language experts. One group of theorists argues that language input merely triggers grammatical knowledge that is already genetically available.[2] The opposition argues that grammatical knowledge results from the way the human mind analyzes and organizes information and is not innate.[3] This debate reflects fundamentally different beliefs about human development and is not likely to be resolved. However, there are at least two areas in which there is a substantial consensus that can guide educators and

policy-makers: (a) the predictability of the course of language acquisition; and (b) its multi-determinate nature.

Research Results

Predictable language sequences

In broad strokes, the observable "facts" of language development are not in dispute. Most children begin speaking during their second year and by age two are likely to know at least 50 words and to be combining them in short phrases.[4] Once vocabulary size reaches about 200 words, the rate of word learning increases dramatically and grammatical function words such as articles and prepositions begin to appear with some consistency.[5] During the preschool years, sentence patterns become increasingly complex and vocabulary diversifies to include relational terms that express notions of size, location, quantity and time.[6] By the age of four to six or so, most children have acquired the basic grammar of the sentence.[7] From that point onward, children learn to use language more efficiently and more effectively. They also learn how to create, and maintain, larger language units such as conversation or narrative.[8] Although there are individual differences in rate of development, the sequence in which various forms appear is highly predictable both within and across stages.[9]

Determining factors

There is also considerable agreement that the course of language development reflects the interplay of factors in at least five domains: social, perceptual, cognitive processing, conceptual and linguistic. Theorists differ in the emphasis and degree of determination posited for a given domain, but most would agree that each is relevant. There is a large body of research supporting the view that language learning is influenced by many aspects of human experience and capability. I will mention two findings in each area that capture the flavour of the available evidence.

Social

1- Toddlers infer a speaker's communicative intent and use that information to guide their language learning. For example, as early as 24 months, they are able to infer solely from an adult's excited tone of voice and from the physical setting that a new word must refer to an object that has been placed on the table while the adult was away.[10]

2- The verbal environment influences language learning. From ages one to three, children from highly verbal "professional" families heard nearly three times as many words per week as children from low verbal "welfare" families. Longitudinal data show that aspects of this early *parental* language predict language scores at age nine.[11]

Perceptual

1- Infant perception sets the stage. Auditory perceptual skills at six or 12 months of age can predict vocabulary size and syntactic complexity at 23 months of age.[12]

2- Perceptibility matters. In English, the forms that are challenging for impaired learners are forms with reduced perceptual salience, e.g. those that are unstressed or lie united within a consonant cluster.[13]

Cognitive processes

1- Frequency affects rate of learning. Children who hear an unusually high proportion of examples of a language form learn that form faster than children who receive ordinary input.[14]
2- "Trade-offs" among the different domains of language can occur when the total targeted sentence requires more mental resources than the child has available. For example, children make more errors on small grammatical forms such as verb endings and prepositions in sentences with complex syntax than in sentences with simple syntax.[15]

Conceptual

1- Relational terms are linked to mental age. Words that express notions of time, causality, location, size and order are correlated with mental age much more than words that simply refer to objects and events.[16] Moreover, children learning different languages learn to talk about spatial locations such as *in* or *next to* in much the same order, regardless of the grammatical devices of their particular language.[17]
2- Language skills are affected by world knowledge. Children who have difficulty recalling a word also know less about the objects to which the word refers.[18]

Linguistic

1- Verb endings are cues to verb meaning. If a verb ends in –ing, three-year-olds will decide that it refers to an *activity,* such as *swim*, rather than to a *completed change of state,* such as *push off*.[19]
2- Current vocabulary influences new learning. Toddlers usually decide that a new word refers to the object for which they do not already have a label.[6]

Conclusions

Nature and nurture

These are just some of the findings that, taken together, speak convincingly of the interactive nature of development. Children come to the task of language learning with perceptual mechanisms that function in a certain way and with finite attention and memory capacities. These cognitive systems will, at the least, influence what is noticed in the language input, and may well be central to the learning process. Similarly, children's prior experience with the material and social world provides the early bases for interpreting the language they hear. Later, they will also make use of language cues. The course of language acquisition is not, however, driven exclusively from within. The structure of the language to be learned, and the frequency with which various forms are heard, will also have an effect. Despite the theoretical debates, it seems clear that language skills reflect knowledge and capabilities in virtually every domain and should not be viewed in an insular fashion.

Educational and Policy Implications

Educators and policy-makers have often ignored preschoolers whose language seems to be lagging behind development in other areas, arguing that such children are "just a bit late" in talking. The research evidence suggests instead that language acquisition should

be treated as an important barometer of success in complex integrative tasks. As we have just seen, whenever language "fails" other domains are implicated as well – as either causes or consequences. Indeed, major epidemiological studies have now demonstrated that children diagnosed with specific language disorders at age four (i.e. delays in language acquisition *without* sensori-motor impairment, affective disorder or retardation) are at high risk for academic failure and mental-health problems well into young adulthood.[20,21] Fortunately, the research evidence also indicates that it is possible to accelerate language learning.[22] Even though the child must be the one to create the abstract patterns from the language data, we can facilitate this learning (a) by presenting language examples that are in accord with the child's perceptual, social and cognitive resources; and (b) by choosing learning goals that are in harmony with the common course of development.

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Parents' role in fostering young children's learning and language development

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Topic
Language development and literacy
Parenting skills

Introduction
During the first years of life, children undergo major developmental changes across a range of domains. In particular, the entry into "formal language" is one of the most heralded achievements of early development. Language enables children to share meanings with others, and to participate in cultural learning in unprecedented ways. Moreover, language is foundational to children's school readiness and achievement. For these reasons, a vast body of research has been dedicated to understanding the social-contextual factors that support children's early language and learning. This work is also central to practitioners, educators and policy makers who seek to promote positive developmental outcomes in young children.

Subject
Developmental scholars have long been interested in documenting the social experiences that help explain within- and between-group variation in children's early language and learning.[1,2] This work is anchored in the writings of scholars such as Bruner[3,4] and Vygotsky,[5] who posited that learning occurs in a socio-cultural context in which adults and primary caregivers support or "scaffold" young children to higher levels of thinking and acting. According to this view, children who experience sensitive, cognitively stimulating home environments early in development are at an advantage in the learning process.

Problem
Research into the factors that promote positive language growth and learning in young children is central to addressing achievement gaps that exist in children from different ethnic, language, racial, and socioeconomic backgrounds. Children enter school with different levels of skill, and these initial differences often affect children's subsequent language growth, cognitive development, literacy and academic achievement.[6,7,8] Children who exhibit delays at the onset of schooling are at risk for early academic

difficulties and are also more likely to experience grade retention, special education placement, and failure to complete high school.[9,10,11]

These delays are particularly evident in children living in poverty. Children from low-income households lag behind their peers in language skills from early on,[2,12] and have been shown to develop vocabularies at slower rates than their peers from more economically advantaged households.[7] Smaller receptive and productive vocabularies, in turn, predict children's later reading and spelling difficulties in school.[8,13]

Research Context

The demographic profiles of minority and immigrant populations in the U.S. and Canada have changed dramatically over the past decade− a shift that has generated research on the widespread disparities that exist in children's school readiness across ethnic, racial and socioeconomic lines.[14,15,16,17,18] Because group disparities in learning exist prior to kindergarten, researchers and practitioners alike seek to understand the role of children's early home environment in the learning process.[19,20,21,22,23]

Research Questions

Inquiry into the role of the home environment on young children's language and learning can be classified under two broad questions: (1) *Which aspects of parenting matter for children's early language and learning, and why?* and (2) *What factors enable parents to provide a supportive environment to their young children?*

Recent Research Results

Which aspects of parenting matter, and why? Three aspects of parenting have been highlighted as central to children's early language and learning: (1) the frequency of children's participation in routine *learning activities* (e.g., shared bookreading, storytelling); (2) the *quality of caregiver-child engagements* (e.g., parents' cognitive stimulation and sensitivity/responsiveness); and (3) the provision of age-appropriate *learning materials* (e.g., books and toys).[24]

Early and consistent participation in routine *learning activities*, such as shared book reading, storytelling, and teaching about the letters of the alphabet, provide children with a critical foundation for early learning, language growth and emergent literacy.[25,26,27,28] Routine activities provide young children with a familiar structure for interpreting others' behaviors and language, anticipating the temporal sequencing of events, and drawing inferences from new experiences.[29,30] Moreover, engagement in learning activities expands children's vocabularies and conceptual knowledge.[31] In particular, shared bookreading, as well as the sharing of oral stories, facilitate young children's vocabulary growth, phonemic skills, print concept knowledge, and positive attitudes toward literacy.[25,27,32,33,34,35]

A plethora of studies also indicate that the *quality of parent-caregiver interactions* plays a formative role in children's early language and learning. In fact, the amount and style of language that parents use when conversing with their children is one of the strongest predictors of children's early language. Children benefit from exposure to adult speech

that is varied and rich in information about objects and events in the environment.[7,36,37] Additionally, parents who contingently respond to their young children's verbal and exploratory initiatives (through verbal descriptions and questions) tend to have children with more advanced receptive and productive language, phonological awareness, and story comprehension skills.[38,39,40,41]

Finally, the *provision of learning materials* (e.g., books, toys that facilitate learning) has been shown to support young children's language growth and learning.[42,43,44] Learning materials provide opportunities for caregiver-child exchanges about specific objects and actions, such as when a parent and child pretend to cook a meal. In such instances, materials serve as a vehicle for communicative exchanges around a shared topic of conversation. Specifically, exposure to toys that enable symbolic play and support the development of fine motor skills has been shown to relate to children's early receptive language skills, intrinsic motivation and positive approaches to learning. [45,46] In addition, children's familiarity with storybooks has been linked to their receptive and expressive vocabularies and early reading abilities.[26,27]

What factors predict positive parenting? Researchers agree that parenting is multiply determined by characteristics of both parents and children. In terms of parent characteristics, parent age, education, income, and race/ethnicity (to name a few) have all been shown to relate to the three aspects of parenting discussed above. For example, compared to older mothers, teen mothers display lower levels of verbal stimulation and involvement, higher levels of intrusiveness, and maternal speech that is less varied and complex.[47,48] Mothers with fewer years of education read to their children less frequently [25,49] and demonstrate less sophisticated language and literacy skills themselves,[50] which affects the quantity and quality of their verbal interactions with their children.[2] Parental education, in turn, relates to household income: poverty and persistent poverty are strongly associated with less stimulating home environments,[51] and parents living in poverty have children who are at risk for cognitive, academic, and social-emotional difficulties.[52,53] Finally, Hispanic and African American mothers are, on average, less likely to read to their children than White, non-Hispanic mothers;[54] and Spanish-speaking Hispanic families have fewer children's books available in the home as compared to their non-Hispanic counterparts.[25] These racial and ethnic findings are likely explained by differences in family resources across groups, as minority status is often associated with various social-demographic risks.

Child characteristics, such as gender and birth order (as two of many examples), have also been linked to early measures of language and learning. For example, girls tend to have a slight advantage over boys in the early stages of vocabulary development, [55,56,57] and studies have documented that families spend substantially more time in literacy-related activities with girls than with boys.[58] Firstborn children have slightly larger vocabularies on average than their later-born peers.[59] Further, mothers differ in their language, engagement and responsiveness toward their first- and laterborn children, with input favoring firstborns.[60]

Research Gaps

In light of evidence that children from low-income and minority backgrounds are more likely to exhibit delays in language and learning at school entry, additional work is needed to understand why these differences exist, and how to best support parents in their provision of positive home environments for their children. Future research should investigate the ways in which multiple aspects of the home learning environment jointly contribute to developmental outcomes in children. Moreover, studies on "school readiness" should begin at the earliest stages of infancy, as this is the period when foundational language and knowledge develops. In this regard, research on the language development and school readiness of children from language minority households should focus on how in- and out-of-home language experiences jointly contribute to children's proficiency in both English and their native language. Finally, most research on the social context of children's language and learning is focused on children's interactions with mothers. Given the rich social networks that comprise infants' and toddlers' environments, future studies should examine the literacy opportunities offered by multiple members of young children's social worlds, including fathers, siblings, extended family members, and childcare providers.

Conclusions

There exists irrefutable evidence for the importance of children's early language and learning for later school readiness, engagement and performance. Children's experiences at home are critical to early language growth and learning. In particular, three aspects of the home literacy environment promote children's learning and language: learning activities (e.g., daily book reading), parenting quality (e.g., responsiveness), and learning materials (e.g., age-appropriate toys and books). Additionally, parents with more resources (e.g., education, income) are better able to provide positive learning experiences for their young children. Finally, children also play a key role in their own learning experiences, as exemplified by links between child characteristics and parenting behaviors. Children affect parents just as parents affect children; it is therefore critical to acknowledge the transactional nature of children's early language and learning experiences.[61]

Implications

Research on children's early learning environments is relevant to policy makers, educators, and practitioners who seek to promote the positive language development and learning of young children. Intervention and preventive efforts should target multiple aspects of children's early language and learning environments, including supporting parents in their provision of literacy-promoting activities, sensitive and responsive engagements, and age-appropriate materials that facilitate learning. Moreover, these efforts should begin early in development, as children are likely to benefit most from supportive home environments during the formative years of rapid language growth and learning.[22,62,63] Finally, interventions with parents that aim to support children's learning should attend to the cultural context of early development when working with parents from different backgrounds, and also consider the broader social context of parenting by attending to the barriers created by poverty and low parental education.

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Language Development and its Impact on Children's Psychosocial and Emotional Development

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Topic
Language development and literacy

Introduction
Normal speech and language development is a cornerstone for successful outcomes later in life. Speech and language competency does not progress normally for a sizeable number of children, however, and research shows that these children are at greater risk for later psychosocial problems than children who do not have speech or language impairments.

Studies have produced compelling evidence that the psychosocial outcomes of language-impaired children are disproportionately problematic. These outcomes include speech and language competence, intellectual and executive functioning, educational adjustment and achievement, and psychiatric disorder. Key insights from these studies highlighted in this fact sheet imply a need for early identification of language problems and effective intervention.

Subject
Impaired language development in childhood increases the risk for concurrent and later problem behaviour. There is strong evidence for the association between speech and language impairments and psychiatric disorders.[1,2,3] Children with speech and language impairments have increased rates of concurrent attention-deficit hyperactivity disorder and anxiety disorders[4,5,6] and psychiatric disorders at age 12.[7] Cognitive deficits characterize attention-deficit hyperactivity disorder or its subgroups.[8,9,10] There is an association between deficient verbal skills and juvenile delinquency.[11] Children with auditory comprehension and pervasive language problems at age five were more likely to experience concurrent and early adolescent behavioural problems than children with speech impairments alone or children with normal language development.[5]

A history of early language impairment is consistently associated with poor academic performance.[12,13] Clinically referred speech- and language-impaired children have poorer academic performance than children in the general population[14,15,16] and prospective, non-clinical studies reveal similar conclusions.[7,17,18,19,20]

Speech and language impairment may be a precursor to substance use and abuse. It is hypothesized that difficulty in self-regulation underlies substance-use disorders and that language impairment is a facet of executive dysfunction.[21,22] Consequently, language impairment may impede the use of language as the intermediary to evaluate the consequences for an action and it may reduce available alternative strategies for any given action. Some data show that children with speech and language problems have a greater risk of substance-use disorders than their non-impaired peers,[23] but support for this link is not uniform.

Problems

The natural history of speech and language impairments is incomplete. First, many samples utilized for studying speech and language impairments have been clinic-referred, not community-based.[1,24] Referred individuals typify only the most severely impaired persons, not the entire spectrum of speech and language impairments and not the general population. Second, there are no published reports about the persistence of impairments in non-referred samples beyond adolescence, into adulthood. Third, most studies of speech and language impairments are one-time studies without follow-up. These designs are ill suited to drawing strong causal inferences. Other studies have not employed a control group of non-impaired subjects matched to language-impaired subjects. These studies are retrospective and have had difficulty securing objective data on the language history of the control subjects. Fourth, studies of substance-use disorders have posited learning disorders or academic achievement as proposed precursors to outcomes. This is problematic because low academic achievement may be a result of truancy and absenteeism and is not necessarily due to a learning disorder. Fifth, available studies seldom include measurement of outcomes across multiple domains of functioning. This is a crucial shortcoming because problems in other domains of psychosocial function may persist even if speech and language difficulties resolve.

Research Context

The Ottawa Language Study (OLS) is well positioned to investigate psychosocial outcomes and language development. The OLS took a one-in-three random sample of all five-year-old English-speaking children in the Ottawa-Carleton region of Ontario, Canada in 1982. The children were administered a speech and language screening procedure by qualified speech pathologists. The procedure resulted in a sample of 142 speech- and language-impaired children. A control sample of 142 children matched for age and sex and taken from the same classroom or school as the language-impaired children was recruited simultaneously. Both samples completed surveys or assessments of cognitive, developmental, emotional, behavioural and psychiatric functioning. Three follow-up studies of original OLS participants were undertaken when participants were approximately ages 12, 19 and 25.

Key Research Questions

Some of the key questions posed by the OLS have been: Are language impairments associated with behavioural problems, both concurrently and over time? Do outcomes vary as a function of type of language impairment? Do language groups differ in later

academic achievement? Are childhood language impairments associated with greater frequency of psychiatric disorders, particularly substance-use disorders?

Recent Research Results

In the OLS, young adults (age 19) with childhood language impairments had significantly elevated rates of anxiety disorder compared with control subjects, and rates of antisocial personality disorder among males that were almost three times higher.[25] Rates of substance-use disorder in young adulthood were not higher among speech- and language-impaired children and neither were rates of affective disorders. Children with language impairments at age five were about eight times more likely to have age-19 learning disabilities than children without language impairments.[13] Children with poor comprehension at age five showed increased hyperactivity and externalizing behaviour at age 12; they also showed lower social competence at age 12 compared with others – that is, less successful interaction outside the home involving non-family members.[7]

Conclusions

A major OLS finding is that outcomes for children with history of a language impairment are distinctly more negative than outcomes for speech-impaired-only children and non-impaired children. Language-impaired children showed prominent concurrent and long-term deficits in the language, cognitive and academic domains relative to peers without early language difficulties.[26] This was particularly evident with respect to anxiety disorders and antisocial personality disorders among boys. Early language impairment rather than speech impairment (or no impairment) is associated with academic difficulties into young adulthood. Children identified as language-impaired at age five lagged well behind their age-19, non-language-impaired peers on educational achievement, and this finding cannot be explained by language-impaired youths having had lower intellectual ability well before age 19.[13]

Rates of substance-use disorder among young adults with a childhood history of speech and language impairments do not appear to be higher than others. In fact, rates of substance-use disorders may be higher among non-language-impaired children with childhood conduct problems than among speech- and language-impaired children.[27] It has been suggested that the language impairment of these children insulates them from social situations that would facilitate higher substance use. However, children with speech and language impairments are at increased risk for learning disabilities, and children with persistent learning disabilities (at ages 12 and 19) have a higher risk of substance-use disorders.[28]

Implications for the Policy and Services Perspective

Children with language impairments have relatively poor long-term outcomes. They are more likely to have anxiety disorders in young adulthood; anxiety disorders have a negative impact on the quality of life of affected adults[29] and substantial economic and health-care costs.[30] Furthermore, early childhood language impairments are stable across time[26] and their impact can be observed from childhood into young adulthood. Recent research supports the efficacy of early language intervention.[31] Speech and language

professionals should make strong efforts to educate the public and other professionals on the potential importance of early language intervention.[26]

Children with a history of speech and language impairment are more likely to have multiple problems than their non-impaired counterparts. They have a higher rate of co-occurrence of two or more psychiatric disorders (comorbidity) and lower overall functioning. They may benefit most from an early intervention. This points out the urgency for early identification of language impairments and the development and maintenance of proven treatment programs that take into account the multiplicity of adversity faced by these at-risk children.[25]

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The Impact of Language Development on the Psychosocial and Emotional Development of Young Children

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Topic
Language development and literacy

Introduction
Language and communicative competence provide critical tools for learning, engaging in social relationships, and behaviour and emotion regulation from infancy onward. This report describes the evolution of language development in the first five years of life and its interrelationship with psychosocial and emotional development and disorder across the life span. Implications for prevention, intervention, education and public policy will also be discussed.

Subject Relevance
Two domains are considered under the rubric of language: structural language and pragmatic communication. *Structural language* skills encompass the sounds of language (phonology), vocabulary (semantics), grammar (syntax and morphosyntax), narrative discourse, and auditory verbal information processing. *Pragmatic language* skills include behaviours such as conversational or other communicative turn-taking, making good use of gestures and maintaining eye contact. As well as these specific aspects of language and communication, children must be able to both express their thoughts (expressive language) and understand those of others (receptive language) in both social and learning situations.

When children have difficulty understanding others and expressing themselves, it is not surprising that psychosocial and emotional adjustment problems ensue. Conversely, a relatively large proportion of school-aged children who have psychosocial and emotional disorders often have problems with language and communication.[1]

Problems
It can be difficult to separate psychosocial and emotional problems from problems with language and communication. Language impairments can be subtle and go undetected unless a formal assessment is done.[2] For instance, Kaler and Kopp[3] showed that toddlers' compliance with adult commands was related to how well they understood language. In another study, Evans[4] found that many preschoolers described as shy, reticent or inhibited had language impairments that interfered with forming and maintaining friendships.

Children with language impairments had difficulty entering into peer group conversations and were then excluded, giving them less opportunity to learn and practice the social skills they needed for peer interaction. Failure to identify and treat such problems can have serious consequences.

Research Context

Language development and impairment and their association with psychosocial and emotional development and disorder have been examined in cross-sectional and longitudinal studies of community and clinic (both speech-language clinic and mental-health clinic) samples ranging from infancy through adolescence. In these studies, aspects of language and skills with which language and communication are associated have been examined.

Key Research Questions

Key research questions include: (1) What is the pattern of development of communication and language in the first five years of life? (2) What is the prevalence of language and communicative impairment in the general population between birth and age five? (3) With which psychosocial and emotional disorders are language impairments associated? (4) Are there other developmental functions associated with language impairment other than psychosocial and emotional disorders? (5) What is the outcome for children with communication and language impairments? (6) What causal factors contribute to an association of language impairment with psychosocial and emotional development? (7) Is there something specific about language as a focus for study? (8) What are the best ways of treating language impairments?

Recent Research Results

In the first five years of life, the evolution of communication can be divided into three periods.[5] The first period begins at birth when infants communicate through their cries, gazes, vocalizations and early gestures. These early communicative behaviours are not intentional, but set the stage for later intentional communication. In the second period, from six to 18 months, infants' communicative engagement with adults becomes intentional. A major turning point is the appearance of *joint* attention,[6] which involves infants coordinating visual attention with that of another person regarding objects and events.[7] In the third period, from 18 months onward, language overtakes action as children's primary means of learning and communication. For instance, preschoolers can engage in conversations about emotions that take into account another's affective state,[8] can use language for self-control[9] and have the capacity to negotiate verbally.[10]

It is estimated that 8 to 12% of preschool children have some form of language impairment.[11] Most children are not identified until two to three years of age when they fail to speak. Further, approximately half of preschool- and school-aged children referred to mental-health services or placed in special classes have language impairments or language-related learning disabilities.[2] There are no data on the prevalence of preverbal communication problems in infants, although the availability of new screening tools now makes this possible.[12]

A range of psychosocial and emotional disorders has been associated with language impairment. In infants, problems with emotion and behaviour regulation (e.g. difficulty being soothed, eating and sleeping) are most common.[13] Physical and expressive vocabulary are associated with spoken vocabulary as early as 19 months of age.[14] From the preschool years, the most common diagnosis among children with language impairments in the community who are referred to speech-language and mental-health clinics is Attention Deficit (Hyperactivity) Disorder.[15,16,17] Language impairments do not exist in isolation and from early childhood, language development is also linked with cognition, social cognition and motor skills.[2, 17]

Longitudinal studies yield sobering findings for children with language impairments.[18] Language and communication impairments are consistently related to learning and psychosocial and emotional disorder from infancy to adolescence.[16,19,20,21] The prognosis is poorest for children who have difficulties in understanding language or in multiple areas of language that continue beyond the age of five years.[19,22]

Both genetic and environmental factors contribute to language and psychosocial and emotional development.[23] Children who are poor communicators do not send clear messages and therefore may be difficult to read and respond to appropriately. The amount and kind of language stimulation at home[24] and family stresses such as child abuse[25] also contribute to children's language development.

The question still remains as to whether there is something specific about language as a focus for study. On the one hand, language may be just one of a range of developmental functions caused by a common underlying factor.[26] On the other hand, language may have a central role to play in the development of psychosocial and emotional disorders in that internalized language and verbally mediated rules play an important role in both self-control and achievement across domains.[27]

Conclusions

From infancy onward, language and psychosocial and emotional development are interrelated. Communication begins in the very first days of life. Potential problems that begin in relationships with parents can ultimately spiral as children enter school and have difficulty learning and getting along with teachers and peers. Even mild language impairments can have an impact on the course of development. Outcomes are worsened by the presence of co-occurring environmental stresses. Because language competence is critical for both school readiness and psychosocial and emotional adjustment, problems with language and communication can set a child on a maladaptive trajectory throughout life.[28] Language problems can be subtle and may be overlooked in learning and therapeutic situations.[1] Therefore, identification and assessment of language disorders, and intervention, are important in the early years, setting the stage for later competence in a broad range of areas.

Implications for Policy and Services

Starting from infancy, routine assessment of language and communication skills and provision of interventions are essential preventive undertakings. This is important

because interventions during infancy or the preschool years can have a significant impact on child outcomes.[29] Once identified, creating a comprehensive profile of communication, language, cognitive and psychosocial and emotional abilities is crucial to planning such preventive interventions. There has been a move away from one-to-one clinic-based therapy to a focus on functional language in naturalistic environments.[30] Interministerial and multidisciplinary integration is required because of the implications that undiagnosed language impairments have for health, mental health, child care, education and the youth justice system. Information on the nature of language impairments, and their impact on academic and psychosocial and emotional functioning, should be available to parents and be part of the curriculum for professionals working with children. This includes pediatricians, family practitioners, speech/language pathologists, educators, early childhood educators and mental-health practitioners.

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Language Development and Literacy: Comments on Beitchman and Cohen

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Topic
Language development and literacy

Introduction
Beitchman and Cohen both address the issues of language development and its impact on academic, psychosocial and emotional development, by focusing on the poor outcomes of children with primary difficulties in speech and language impairments (i.e. problems that cannot be accounted for by any other condition, known as specific language impairments or SLI). Both also focus on impairments in structural aspects of receptive and expressive language skills (phonology, semantics, syntax, morphosyntax, narrative discourse, auditory verbal information processing) and accord little attention to the outcome of impairments in pragmatic aspects (the appropriate use of language within social, situational and communicative contexts). Nonetheless, it is important to understand that speech and language impairments may also occur as secondary difficulties to a primary condition such as autism, hearing impairment, neurological impairment, general developmental difficulties, behavioural or emotional difficulties, psychosocial adversity (e.g. adverse rearing conditions associated with growing up in poverty, orphanages, refugee camps or war zones) or immigration (English language learners).

Beitchman approaches the topic from the research context of his 20-year prospective longitudinal epidemiological study of five-year-old English-speaking children from one geographic region of Canada. By contrast, Cohen situates the topic more broadly, calling upon evidence from national and international studies of clinical and epidemiological populations, using cross-sectional and longitudinal designs. Thus, while Beitchman's study provides a rich source of data on the outcomes of SLI in an English-speaking context for Canadian policy and service perspectives, the results presented by Cohen provide an opportunity to look for independent replication of findings across studies and English-speaking cultures.

Research Results and Conclusions
Both authors concur that preschool SLI increases the risk for negative sequelae in terms of subsequent language and literacy abilities, poor social and emotional competency in terms of internalizing difficulties (e.g. social isolation, withdrawn social interaction styles or anxiety disorders) and externalizing difficulties (e.g. aggression, attention-

deficit/hyperactivity disorder [ADHD], antisocial personality disorder). In addition, recent research highlights the increased risk of victimization (e.g. being teased, ridiculed, threatened, bullied), which in turn may contribute to subsequent antisocial personality disorder.[1] One relatively minor point is the potentially misleading conclusion about mental health outcomes in young adulthood, which are listed by Beitchman as anxiety disorders and antisocial personality disorder. This could be misinterpreted as indicating that the relationship between SLI and ADHD, which is evident in childhood, dissipates by adulthood, whereas the problem is that ADHD and other Axis I and Axis II disorders were not investigated in the 19-year-old follow-up study.

Both Cohen and Beitchman conclude that the risk resides with language impairment (with and without accompanying speech impairments), rather than with speech impairment per se. In contrast, recent evidence indicates that speech impairment may be a risk factor for phonological processing, phonological learning and literacy.[2,3] Not only are persistent speech impairments (beyond age six) associated with poor literacy outcome, but also even children with apparently resolved speech impairments manifest marked problems in spelling despite relatively intact language abilities.[4] One critical distinction that needs to be made is between inaccurate production of speech sounds and difficulties in phonological processing.[5] The latter is a circumscribed component of language that is well established as a risk factor for reading disorder (dyslexia). The problem is that phonological processing skills may be overlooked and not investigated in the presence of severe articulatory problems without concurrent oral language impairments.

Cohen and Beitchman also conclude that preschool SLI is associated with poor academic functioning, but do not specify the nature of this problem. Robust evidence indicates that SLI is a major cause of problems in both reading (particularly reading comprehension) and written language.[3,6,7] Moreover, recent evidence highlights the sensitivity of written language indices to the longer-term outcome of oral language impairments.[5] Specifically, written language deficits are evident even in those children whose earlier language impairments appear to have resolved, including purportedly unaffected monozygotic twins of children with language impairments.[5] Moreover, one index of expressive language (non-word repetition), which has been proposed as an effective marker of the heritable form of language impairments,[8,9] predicted written language impairments.[5]

One critical and non-trivial issue briefly alluded to by Cohen is the extent to which SLI constitutes a specific disorder that is unique from other neurodevelopmental disorders such as dyslexia. This issue, which remains unresolved and controversial,[10] has important implications for policy and service delivery perspectives and requires in-depth investigation.

The primary limitations of both of these summary texts from the point of view of policy and service delivery perspectives are: 1) the absence of prevalence data for the various subtypes of SLI, and at different ages/developmental stages; and 2) the apparent accordance of equal weighting to findings from studies that vary in methodological rigour. Moreover, the conclusions are based on a non-systematic review of the literature.

Importantly, however, the conclusions are largely consistent with those reported in recent meta-reviews.[11,12,13]

Implications for Policy and Services Perspectives

Both authors argue for the need for routine assessment of language and communication skills, starting from infancy, with the rationale that intervention during infancy or preschool years can have a significant impact on child outcomes. Moreover, both argue the need for professionals to educate parents about the significance of SLI and the need for intervention. In particular, Beitchman accords speech and language pathologists the responsibility for educating the public and other professionals in this regard.

There are several problems with these broad recommendations. First, a recent review concluded that there is insufficient evidence to warrant universal screening at this point in time.[12] Barriers to be overcome include the development of screening measures with improved sensitivity, consensus on case definition, and a more complete understanding of the prevalence and natural history of the various subgroups of SLI.[12,13] This should not be interpreted as a recommendation against case identification, since early SLI clearly constitutes a major problem in its own right and may flag an increased risk for other problems. Alternate approaches to universal screening might include screening populations at high risk for SLI or screening populations identified by parental concern about possible SLI or related socio-emotional or behavioural problems.[13]

Second, despite Beitchman's claim of demonstrated efficacy of early language intervention, a recent meta-analysis reveals mixed evidence for short-term effects and little or no evidence of the long-term effectiveness of the programs on language abilities per se.[11] For example, there is no robust evidence of effective intervention for receptive language difficulties. Moreover, although there is some support for beneficial effects of intervention on primary caregivers who provide the communicative environment, there are no data on the effects of intervention on amelioration and prevention of associated problems such as poor literacy and psychopathology (anxiety, attention-deficit/hyperactivity disorder, antisocial personality disorder).

Third, making speech and language pathologists responsible for educating the public and other professionals poses major challenges, the least of which is the inadequate supply of this category of professionals. More importantly, enhancing parent recognition of the child's potential problem and the need to seek help are among the primary barriers to accessing the existing services.[14] In today's multicultural and technological society, information about the significance of language impairments and the need for intervention may be most effectively delivered by and accessed through responsible media (multicultural TV, radio, newspapers) backed by government policy and funding.

Finally, additional key issues are missing from these two articles, including the following; 1) consensus statements about the definitions of boundaries around the population(s) in need of service; 2) consensus approach to the operationalization of these boundaries (i.e. standards of assessment and diagnosis), with particular attention to populations for whom English is not the primary language of the family; 3) estimates of

prevalence and incidence with reference to regional and ethnic/cultural variations, along with any projected changes in these rates; 4) standards for service providers (particularly for daycare providers, early childhood educators, classroom teachers and pediatric speech-language pathologists); 5) evidence of cost-effective evidence-based intervention approaches and their relative efficacy at various developmental stages; and 6) challenges and solutions to accessibility to services, particularly for inner-city, rural, indigenous and ethnic populations.

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Literacy, Language and Emotional Development

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Topic
Language development and literacy

Introduction
Learning to read is the central achievement of early elementary schooling. Children bring with them experiences, knowledge and skills that facilitate their acquisition of efficient and accurate reading skills. The view adopted here is that children will spend their first three years of school learning to read, and then will start using reading to learn.[1] Moreover, accurate comprehension of written texts presupposes that children can read individual words effortlessly.[2] Early educators will want to understand what skills children need to ensure successful learning in grades one, two and three. This report will focus on early language skills that have been linked to efficient word reading and reading comprehension, namely children's awareness of the spoken language and their vocabulary. In addition, the report will present some of the limited evidence showing that the degree to which children learn to read successfully is linked to their self-concepts.

Subject
Successful and full participation in Western societies presupposes that individuals know how to derive meaning from written texts. Unfortunately, the latest statistics show that a substantial number of Canadians have poor reading abilities that can jeopardize their integration in the workplace.[3] Longitudinal studies have clearly shown that differences in reading performance are established early and remain relatively stable over time.[4,5] Most children who have poor reading skills at the end of grade one will continue to experience difficulties reading later on. It is therefore important to intervene early in the lives of children to prevent reading problems and their negative consequences.

Problem
Parents, educators and researchers share a common concern: how to ensure that every child can comprehend written texts efficiently and accurately.

Research Context

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Researchers have adopted various methodologies to understand better how children learn to read. Although the choice of one particular methodology, its underlying assumptions and the findings it produces can lead to heated debates, practitioners are wise to examine the available research for converging evidence to develop sound practices. Converging evidence is obtained when observational, correlational, experimental and intervention studies point to the same conclusion.

Key Research Questions

A series of key questions continue to guide the research on reading that focuses on the transition from preschool to the early school years. Some of the most important questions are listed below:

1. What skills and knowledge do children bring with them that will facilitate the acquisition of reading?
2. What are the experiences that promote early literacy skills and knowledge as well as motivation to read?
3. How can we identify children who are at risk of having reading problems?
4. How can we intervene early in the lives of at-risk children to prevent reading problems?
5. What teaching methods are best suited to optimize the number of children who will learn to read successfully?

An adequate presentation of recent findings on each of these questions is beyond the scope of the present chapter. Readers can obtain an excellent understanding of recent findings that address these issues by reading the article by Rayner et al.[6] as well as the 2008 report of the National Early Literacy Panel (US).[4]

Recent Research Findings

The view herein is that early language skills play an important role in the acquisition of reading, and that learning language and learning to read are related but distinct domains. Recent research findings pertaining to two language skills, phonemic awareness and vocabulary, are discussed below. In addition to these topics, some findings on the role of reading on children's developing self-concepts are discussed.

Phonemic awareness. Over the past 20 years, researchers have made important advances in understanding the role of children's awareness of the spoken language. The term phonemic awareness refers to the ability to identify, compare and manipulate the smallest units of spoken words — phonemes.[7] Most spoken words contain more than one phoneme; for example, *cat* has three phonemes and *spill* has four phonemes.

- There is some evidence that children first become aware of larger units of spoken language such as words within sentences and syllables within words; however, awareness of phonemes themselves is the best predictor of reading.[2,7,8]
- Awareness of phonemes measured in kindergarten is one of the best single predictors of reading at the end of grade one. Phoneme awareness is thought to help children learn to read because it allows children to understand that letters correspond to the sounds of spoken language.[7,8]

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- Intervention studies clearly show that teaching phonemic awareness to young children benefits word reading as well as reading comprehension.[7,8] Intervention studies that included alphabet letters in activities on phonemic awareness were the most successful.[7]

Vocabulary. The ultimate goal of reading instruction is to ensure that children understand the texts they read. Comprehending written texts is a complex process that involves fluent word recognition as well as the activation of word and world knowledge, making inferences and integrating parts into a coherent whole.[2] Given this view of reading comprehension, children's vocabulary is one component of oral language that is necessary to reading comprehension.[9]

- Children's vocabulary, measured in kindergarten, is one of the best predictors of reading comprehension in grades three and four.[10]
- Intervention studies show that teaching words presented in a text improves children's understanding of the text.[11]
- It remains to be demonstrated that improving young children's vocabulary skills will have long-term consequences for their reading comprehension.

Self-concepts. There is limited longitudinal evidence on how children's reading skills might affect their self-perceptions. The research is correlational in nature, but it is consistent with the view that children who read poorly tend to perceive themselves as less able and to be less motivated to read.[12,13,14] The longitudinal results suggest that early reading skills predict the development of self-perceptions and rather than the reverse.[14, 15] That is, all children tend to have positive self-perceptions as beginning readers, but these change over time. There is also some evidence showing that children who perceive themselves as less able tend to avoid reading or read less frequently.[15] In turn, reading less frequently further impedes the acquisition of efficient word reading and comprehension skills.[16] Although there is a need for converging evidence, these findings are in accord with the idea that it is crucial for young children to develop strong reading skills quickly.

Conclusions

The accumulated evidence suggests three things:

1. Children with stronger awareness of the structure of language will learn to read more easily than children who have weaker or no awareness of this structure. Most importantly, phonemic awareness can be fostered prior to grade one.
2. Children with stronger vocabulary skills tend to have better reading comprehension skills in grade three. Most importantly, vocabulary can be enhanced at home, in child-care centres and in kindergarten.
3. Children with weaker reading skills tend to have less developed self-concepts and tend to read less. This highlights the importance of early interventions to ensure that children start grade one with the necessary skills and knowledge to learn to read.

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Implications

Parents and educators can promote the development of phonemic awareness and vocabulary in young children. They can do so by incorporating into their daily routines such activities as:

1. *Playing word games* that emphasize the structure of the language. There is evidence that introducing the alphabet along with word games can help children understand that words are made of individual sounds.[7,17] Finally, having young children explore the sound structure of words by encouraging them to capture the sounds they hear with their limited knowledge of the alphabet can also be beneficial.[18]
2. *Reading children's books*. There is sound evidence that young children can learn new words introduced by an adult while looking at pictures in books, or when the adult reads the text in the book. To ensure learning, it is important to read the same books more than once. Parents and educators can borrow children's books from their neighbourhood libraries.[19, 20, 21,22]

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Literacy as an Outcome of Language Development and its Impact on Children's Psychosocial and Emotional Development

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Topic
Language development and literacy

Introduction
One of the most striking accomplishments of the preschool years is the child's effortless development of speech and language. With respect to spoken language development, the preschool years represent a period of learning language. As children enter school, they are expected to use these newly developed language skills as tools for learning and increasingly for social negotiation. The important role of spoken and written communication in school-aged children's lives suggests that individual differences in these skills may entail risks in terms of broader academic and psychosocial competence.

Subject
Spoken language competence involves several systems. Children must master a system for representing the meaning of things in their world. Children must also acquire a facility with the forms of language, ranging from the sound structure of words to the grammatical structure of sentences. Additionally, this knowledge must be joined with their social competence. Mastery of these skills, which occurs during the preschool years, will allow the child to function as a successful listener and speaker in many communication contexts. Much of this learning is accomplished without formal instruction, and what is known is largely tacit in nature. As preschoolers, children begin to develop an awareness of some of this knowledge. They will make words rhyme and they can manipulate parts of words, such as taking "baby" apart into two syllables, /ba/ and /be/. This ability to think about the properties of words is called phonological processing. There exists a substantial literature showing that early reading development in alphabetic languages such as English is dependent upon the integrity of phonological processing abilities.[1]

Learning to read also requires several skills. It is common to differentiate between two main aspects of reading – word recognition and reading comprehension. Word recognition consists of knowing how a word is pronounced. Good readers can do this by using multiple cues, but importantly they are able to use the conventions concerning the relationship between letter sequences and their pronunciation (decoding). Phonological processing abilities appear to play an important role in the development of this

knowledge and the individual's ability to recognize words. Decoding printed words, however, is not sufficient for reading competence. The reader also needs to be able to interpret the meanings of the printed text in a manner very similar to how utterances are interpreted when heard. The skills involved in this act of reading comprehension are very similar or the same as those used in listening comprehension.

Problems

Children may enter school with poor skills in listening, speaking and/or phonological processing. Children with poor listening and speaking skills are referred to as having a language impairment (LI) and most of them will also have poor phonological processing abilities. Current estimates are that about 12% of children entering schools in the U.S. and Canada have LI.[2,3] There are other children who are sufficiently competent in listening and talking to be viewed as normal in this regard, but for whom phonological processing performance remains poor. At school entry, these children may be viewed as being at risk for reading disorder (RD). Reading disorder is customarily defined as poor reading achievement occurring after sufficient opportunity to learn to read. Thus, RD is often diagnosed after two or three years of reading instruction. Estimates of the prevalence of RD among school-aged children typically range between 10 and 18%.[4,5] Behaviour problems such as Attention Deficit Hyperactivity Disorder (ADHD) and internalizing problems such as shyness and anxiety have been found to be common among children with RD and likewise among children with LI.[6]

Research Context

The relationships between spoken language development, reading development and social development have been explored by several researchers in an effort to determine the extent to which these problems are associated with each other and the bases for these relationships.

Key Research Questions

The prominent research questions have been concerned with the extent to which aspects of early language status are predictive of later reading and behaviour problems and what the possible bases might be for these relationships. Specifically, two hypotheses have figured prominently in the literature. One hypothesis is that the associations between spoken language and later outcomes are causal. Alternatively, the association of language and reading problems with behaviour problems may rest on a common underlying condition such as a neuromaturational delay that results in poor achievement in both domains.

Recent Research Results

Several investigators have examined the reading and psychosocial outcomes of children with LI in the early school years. Several studies have reported poorer reading achievement and higher rates of RD in children with language impairment.[7-12] In these studies, the prevalence of RD in children with LI ranged from 25%[8] to 90%.[11] The strong relationship between RD and LI has been shown to be attributable to the limitations these children have in both their ability to understand language and their phonological awareness.[13,14] The phonological-awareness deficits place them at risk for difficulties in

learning decoding skills and the comprehension problems place them at risk for reading comprehension problems.

Several studies have shown elevated rates of behaviour problems among children with LI.[2,15-20] The most common behavioural problem reported in these studies has been ADHD; however, internalizing problems such as anxiety disorder have also been reported. Some research has shown that these behaviour problems appear to vary with the setting in which the child is observed and in particular are reported by the children's teachers to a greater degree than their parents.[21] This has been interpreted as evidence that these behaviour problems may arise more in the classroom situation than at home and are therefore reactions to classroom stress. Further support for this view arises from data showing that the excess of behaviour problems in children with RD and/or LI is found in those children with both conditions.[6] Thus, these studies support the notion that LI in conjunction with RD results in the child facing excessive failure, particularly within the classroom, which in turn results in reactive behaviour problems. These conclusions, however, fail to explain why behaviour problems seem to be reported in preschool children with LI.[22] These findings could be used to argue for an underlying factor such as neurodevelopmental delay that contributes to all these conditions.

Conclusions

The existence of a strong relationship between spoken language skills and subsequent reading and behaviour development is generally supported in the literature. This evidence comes principally from research done with children who have LI at school entry. The basis of the relationship between early spoken language and later reading development is generally thought to be causal in nature, such that spoken language skills are fundamental precursors to later successful reading. This influence of language on reading primarily involves two aspects of language ability – phonological processing and listening comprehension. Children with limitations in phonological process are at risk for early decoding problems, which can then lead to problems of reading comprehension. Children with problems of listening comprehension are at risk for reading comprehension problems even if they can decode words. The common profile of children with LI is that both aspects of language are impaired and thus the resulting reading problems encompass both aspects of reading (decoding and comprehension). The basis of the relationship between spoken language and later behaviour problems is less clear. The behaviour problems may arise from the spoken and written communication demands of the classroom. Thus, communication failure serves as a stressor and behaviour problems are maladaptive responses to this stressor. Alternatively, the spoken and written language impairment may have a shared underlying etiology with the behaviour problems.

Implications

The evidence is compelling that a foundation in spoken language competence is important for the successful achievement of academic and social competence. Children with poor language skills who are therefore at risk for reading and psychosocial problems can be identified efficiently at school entry. Interventions are available for promoting language growth, and in particular numerous programs exist that are designed to promote the development of phonological processing skills. Likewise, listening comprehension

can be improved in the early school years. These methods focus on strengthening language skills. Additionally, intervention efforts need to consider approaches that provide adapted and supportive educational environments for these children to reduce the potential stressors that may result in maladaptive behaviours. In the future, research efforts focusing on the particular mechanisms that produce this complex of spoken, written and behaviour problems are also needed. Classroom-based studies of how children respond to communication demands and failure would be particularly relevant.

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Literacy and Its Impact on Child Development: Comments on Tomblin and Sénéchal

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Topic
Language development and literacy

Introduction
Only within the last decade has the concept of "literacy" become a central focus in early education. Previously, experts rarely viewed literacy as an essential aspect of healthy growth and development in young children. The current rate of reading problems among school children remains unacceptably high. Estimates show that about 40% of fourth graders struggle with reading at even basic levels and there is a markedly disproportionate representation of children who are poor and who belong to ethnic or racial minorities among those who struggle with reading.[1] The paradigm shift of the last decade, which received a great push forward with the 1998 publication by the United States' National Research Council titled *Preventing Reading Difficulties in Young Children*, has increasingly emphasized early education as the context in which solutions to these pressing problems are most likely to have effect. Early education is the time in which young children develop skills, knowledge and interest in the code-based and meaning aspects of written and spoken language. I refer to these abilities and interests here as "pre-literacy" abilities to emphasize their role as precursors to conventional literacy. The current emphasis on pre-literacy as an essential part of early education draws upon two growing bodies of research showing that:

(1) Individual differences among children in pre-literacy skills are *meaningful* – early differences contribute significantly to longitudinal outcomes in children's reading achievement;[2] and
(2) The prevalence of reading difficulties is more likely to be influenced through *prevention* rather than *remediation*, since once a particular child shows a reading delay in elementary school, the odds suggest that a return to healthy progress is
(3) quite unlikely.[3]

Research and Conclusions
Experts Tomblin and Sénéchal provide timely and relevant discussions of current literature on pre-literacy development and its short- and long-term relationship to other developmental competencies. My reading of their texts suggests that three important

points require further elaboration: decoding precursors, the language-literacy relationship, and the role of temperament and motivation.

First, the current cumulative research literature on early literacy development and its relationship to later reading outcomes identifies three unique predictors of reading competence: phonological processing, print knowledge and oral language.[2] Whereas the first two prepare children most directly for word-level skills (i.e. decoding), the third prepares children to comprehend text with little direct impact on decoding. Tomblin accurately notes that reading competence requires both decoding and comprehension, and Sénéchal emphasizes that children must first "learn to read" before they can "read to learn." Readers should recognize that the relationship between the two aspects of reading is multiplicative, meaning that both sides of the equation (Decoding X Comprehension = Reading) require some value other than 0 for reading to be functional.[4] Neither Tomblin nor Sénéchal adequately emphasizes the importance of ensuring children's development of decoding precursors during the years of early education. Children will never be able to read to learn (i.e. comprehend) if they cannot successfully decode. Children who enter beginning reading instruction with inadequate pre-literacy ability will be unable to keep pace in decoding instruction, which undermines the eventual transition to reading for meaning. Early education is the time in which educators can most readily improve children's odds of becoming a reader by giving them the pre-alphabetic competencies (print knowledge and phonological awareness) that will enable them to profit from decoding instruction.

Second, both Tomblin and Sénéchal emphasize the role of oral language in literacy development yet do not emphasize the relationship of literacy to language development. Scholars increasingly view the integrative relationship between language and literacy as *reciprocal*. Children's engagement in literacy activities, such as storybook reading or listening to rhymes, requires a metalinguistic focus in which oral or written language is the object of attention. Children's ongoing engagement in literacy activities and their developing propensity towards considering language as an object of attention become primary routes for language development. Once children begin to read, even at the most basic level, their reading of text becomes the greatest source of novel words and concepts, complex syntax and narrative structures, which then further propel their language development forward. In short, literacy is an essential vehicle for furthering children's language competencies in both the preschool years and during early and later schooling, and the relationship between language and literacy is more than a "one-way street" – language provides a base from which to explore and experience written language, which in turn further builds children's language competencies.

Third, the role of temperament and motivation in influencing children's pre-literacy accomplishments and experiences requires further consideration than is provided by Tomblin and Sénéchal. Tomblin notes the overlap among internalizing behaviours (e.g. anxiety and depression) and literacy difficulties, and Sénéchal notes that some children may avoid reading experiences, particularly those who view themselves as poor readers. The role played by early motivation, self concept and temperament in pre-literacy development requires greater attention in general, particularly when we consider how to

facilitate other internal competencies (e.g. phonological processing and vocabulary) in prevention programs. Most early educators know that a child's motivation towards literacy is one of the most important contributors to pre-literacy success. By seeking out literacy experiences on their own or in the context of interactions with others, children essentially implement their own pre-literacy interventions! A small yet converging body of research shows that children's motivation towards and engagement in literacy activities varies considerably from child to child and relates uniquely to children's literacy gains from these activities.[5] Some children actively resist pre-literacy experiences, such as storybook reading, and children who have under-developed language skills or who are inexperienced with literacy at home may be more likely to resist literacy activities. The scientific literature has not yet shown why some children resist literacy activities and how this resistance relates more generally to children's temperament. Nonetheless, approaches to supporting young children's engagement in and motivation towards literacy experiences require consideration as one of the more important design characteristics of effective interventions.

Implications for the Policy and Services Perspectives

Current policy and service perspectives are derived from three unequivocal findings in the literature. First, children with an under-developed oral language base will exhibit great vulnerability for achieving reading competence, which in turn inhibits ongoing language development. Second, it is much more difficult to remediate reading problems than it is to prevent them. Third, it is possible to shift the odds towards better literacy outcomes for children with high-quality, intensive, systematic pre-literacy programs delivered to preschoolers and kindergarteners prior to the manifestation of reading problems.

Integrating policy, practice and research

Significant gaps persist in integrating policy, practice and research and in conducting research that can be readily applied to real-world programs. Tomblin emphasizes the need for future research on the mechanisms that produce literacy problems for children with language difficulties. The body of research on such mechanisms is one of the more well-developed and well-funded areas of research in the United States, and it has unequivocally shown the importance of oral language, phonological processing and print knowledge as causally linked to a child's ability to learn to read. What is currently needed is an increased focus on how best to facilitate linkages among policy, practice and research to ensure the effectiveness of real-world efforts to improve literacy outcomes for young children, particularly those who arrive in these programs with under-developed literacy and language skills. Sénéchal offers several evidence-based suggestions for promoting pre-literacy skills for young children, such as playing word games and reading books. The extent to which such activities are effective for children with language weaknesses, have a longitudinal positive effect and can be integrated into existing interventions has yet to receive careful examination.

Does quality matter?

Policy-makers, practitioners and researchers have rarely considered how the quality of adult-child interactions focused on literacy might matter, whether playing word games or

reading books. Developmental theories of how children develop pre-literacy abilities presume that the quality of interaction matters greatly, with children's skills progressing more quickly and more readily in instructional interactions that are characterized by sensitive, responsive and non-controlling adult input. When provided with systematic, research-based early literacy interventions, the quality of teacher delivery of these interactions can vary immensely, and this variation appears to make great differences in children's literacy outcomes. As we design policies and services for young children that are designed to reduce the risk for reading failure through prevention, we must ensure that the relationships and interactions children have with adults – which provide the context in which children's knowledge, skills and interests will grow – are of the highest quality.

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Language Development at an Early Age: Learning Mechanisms and Outcomes from Birth to Five Years

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Topic
Language development and literacy

Introduction
The acquisition of language is one of the more remarkable achievements of early childhood. By age 5, children essentially master the sound system and grammar of their language and acquire a vocabulary of thousands of words. This report describes the major milestones of language development that typically-developing, monolingual children achieve in their first 5 years of life and the mechanisms that have been proposed to explain these achievements.

Subject
Young children's language skills are important to their interpersonal and academic success.[1,2] It is therefore crucial to have descriptions of normative development that allow identification of children with language impairment and to have an understanding of the mechanisms of language acquisition that can provide a basis for optimizing all children's development.

Problem
Although all normal children in normal environments acquire the language (or languages) they hear, children's rates of development – and thus skill levels at any age – vary enormously. One goal of research in the field is to understand the roles of innate abilities and environmental circumstances in explaining both the universal fact of language acquisition and the variability in language development.[3]

Research context
Children's language development has been a topic of interest since antiquity and the focus of substantial scientific research since the 1960s.[4] Although the field has broadened its scope of inquiry in recent years, there is still more research that describes middle-class, monolingual children acquiring English than other groups and other languages.

Recent Research Results

The course of language development and its underlying mechanisms are usually described separately for the subdomains of phonological development (the sound system), lexical development (the words), and morpho-syntactic development (grammar), although these domains are interrelated both in language development and in language use.

Phonological development. Newborns have the ability to hear and discriminate speech sounds.[5] During the first year, they become better at hearing the contrasts their language uses, and they become insensitive to acoustic differences that are not relevant to their language. This tuning of speech perception to the ambient language is the result of a learning process in which infants form mental speech sound categories around clusters of frequently-occurring acoustic signals. These categories then guide perception such that within category variation is ignored and between category variation is attended to.[6, 7]

The first sounds infants produce are cries and noises that are not speech-like. The major milestones of pre-speech vocal development are the production of canonical syllables (well-formed consonant + vowel combinations), which appear between 6 and 10 months, followed shortly by reduplicated babbling (repetitions of syllables). When first words appear, they make use of the same sounds, and they contain the same numbers of sounds and syllables, as the preceding babbling sequences.[8] One process that contributes to early phonological development appears to be infants' active efforts to reproduce the sounds they hear. In babbling, infants may be discovering the correspondence between what they do with their vocal apparatus and the sounds that come out. The important role of feedback is suggested by findings that children with hearing impairment are delayed in achieving canonical babbling. At approximately 18 months, children appear to have achieved a mental system for representing the sounds of their language and producing them within the constraints of their articulatory abilities. At this point children's production of speech sounds becomes consistent across different words– in contrast to the earlier period when the sound form for each word was a separate mental entity.[9] The processes underlying this development are not well understood.

Lexical development. Infants understand their first word as young as 5 months, produce their first words between 10 and 15 months of age, reach the 50-word milestone in productive vocabularies around 18 months of age, and the 100-word milestone between 20 and 21 months.[10] After that, vocabulary development proceeds so rapidly that tracking the how many words children know becomes unwieldy. The vocabulary size of an average 6-year-old has been estimated at 14,000 words.[11]

The task of word learning has multiple components and recruits multiple mechanisms.[12] Infants make use of statistical learning procedures, tracking the probability that sounds appear together, and thereby segmenting the continuous stream of speech into separate words.[13] The capacity to store those speech sound sequences, known as phonological memory, comes into play as entries in the mental lexicon are created.[14] In the task of mapping a newly-encountered word onto its intended referent, children are guided by their abilities to make use of socially-based inferencing mechanisms (i.e., speakers are

likely to be talking about the things they are looking at),[15] by their cognitive understandings of the world (some word learning involved mapping new words onto pre-existing concepts),[16] and by their prior linguistic knowledge (i.e., the structure of the sentence in which a new word appears provides clues to word meaning).[17] Full mastery of the meanings of words may require new conceptual developments as well.[18]

Morpho-syntactic development. Children begin to put two, then three and more words together into short sentences at approximately 24 months of age. Children's first sentences are combinations of content words and are often missing grammatical function words (e.g., articles and prepositions) and word endings (e.g., plural and tense markers). As children gradually master the grammar of their language, they become able to produce increasingly long and grammatically complete utterances. The development of complex (i.e., multi-clause) sentences usually begins some time before the child's second birthday and is largely complete by age 4. In general, comprehension precedes production.[4]

The mechanism responsible for grammatical development is one of the mostly hotly-debated topics in the study of child language. It is argued that children come to the language-learning task equipped with innate knowledge of language structure and that language could not be achieved otherwise. It is also clear, however, that children have the ability, even in infancy, to detect abstract patterns in the speech they hear,[19] and there is very strong evidence that children who hear more speech and who hear structurally more complex speech acquire grammar more rapidly than do children with less experience[3,20] – which suggests that language experience plays a substantial role in language development.

Research Gaps

One gap or disconnect in the field is between the theoretically-driven quest to account for the universal fact of language acquisition and the applied need to understand the causes of individual differences in language development. Relatedly, there is less research on minority populations and on bilingual development than on monolingual development in middle-class samples. This is a serious gap because most standardized assessment tools are not suited to identifying organically-caused delay in minority children, in children from low socioeconomic strata, or in children acquiring more than one language.

Conclusions

The course of language development is very similar across children and even across languages, suggesting a universal biological basis to this human capacity. The rate of development varies widely, however, depending both on the amount and nature of children's language experience and on children's capacities to make use of that experience.

Implications

Normally-endowed children need only to experience conversational interaction in order to acquire language. Many children, however, may not experience enough conversational interaction to maximize their language development. Parents should be encouraged to treat their young children as conversational partners from infancy. Educators and policy

makers should realize that children's language skills reflect not only their cognitive abilities but also the opportunities to hear and use language their environments have provided.

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Early Identification of Language Delay

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Topic
Language development and literacy
Learning disabilities

Introduction
Because language is central to so many aspects of human life – cognition, social interaction, education and vocation – valid identification, prevention, and treatment of language disorders is a high priority for the therapeutic professions. Delay and/or difficulty in beginning to use language is one of the most common causes of parental concern for young children brought to pediatricians and other professionals.

Subject
In this article, we summarize current knowledge about the assessment of young children's language, particularly in the range of 24 to 30 months (for which we have the most extensive information), in order to identify early language delay and/or risk for persistent language impairment. The goal of this screening process is to guide decisions concerning the need for further evaluation and treatment, in order to prevent the development of more significant problems.

Problems
Early identification of language delay must resolve two fundamental problems. The first is the problem of obtaining valid information for individual children at an age when they are often noncompliant, especially those children with limited communication skills who are the primary focus. Furthermore, the assessment technique must be cost-effective with respect to professional time, and broadly applicable for children across a range of social classes and language backgrounds, including bilingualism.

The second problem is one of interpretation. Many children whose language is delayed at 24 or 30 months will catch up over the next few years, and do not warrant intervention.[1] The challenge is to identify and use other relevant information to improve decisions about individual children.

Research context

The solution to the first problem above has been the revival of an older, but neglected technique: parent report.[2,3] Parents have much more experience with their children than professionals, and their experience is more representative of their child's experiences and interests. Vocabulary checklists and related questions for parents have proven to be highly valid measures of early language development.[4,5,6,7]

Solving the second problem has required two programs of research: first, large-scale norming studies to provide a basis for judgment of the relative status of a child's language (delayed or not)[3] and second, longitudinal studies of outcome of early delay to identify predictors of "spontaneous recovery" or continued delay.[1]

Key research questions

Five questions are central to early identification of language delay. First, what is a valid criterion for defining early language delay? Second, how much variability in outcome is there for early delay? Third, what other factors can add to prediction of outcome, and how should they be integrated? Fourth, how do differences related to social class, gender, and ethnicity affect the identification process? And fifth, how should the process be modified for children acquiring two or more languages?

Recent research results

Toddlers who have not attained the expressive language skills exhibited by most children the same age can be identified as having slow expressive language development (SELD). Among English-speaking children, studies suggest that 90% of 24-month-olds have an expressive vocabulary of at least 40-50 words and about 85% are combining words.[6] Based on these findings, two criteria for identifying SELD among 24-month-olds are commonly used: 1) small expressive vocabulary (less than 40-50 words, or below the 10th percentile, depending on the tool used) and/or 2) no word combinations.[6,8] The 10th percentile criterion can be extended to other ages.

Children with SELD at age 2 are at two to five times higher risk for language impairment persisting into the late preschool to elementary school years.[1,9] Although most two-year-olds with SELD have language skills that are within the normal range by school age,[9,10] early expressive language delays should not be ignored, given the elevated risk of persisting language impairment.

Longitudinal studies of two-year-olds with SELD have examined a variety of potential predictor variables for persisting difficulties. Those variables which most regularly are found to make some prediction include parent concern about possible problems with the child's speech/language development or hearing, family history of language impairment or dyslexia (especially first degree relatives: parents, full siblings), receptive language delays, frequent ear infections, limited vocalizations, and delayed pretend play.[10,11,12] Although none of these is a highly accurate predictor by itself, parental concern has been the most consistently associated with language impairment.[1,13] Combining predictors has improved accuracy of predictions, but the optimal combination of predictors is not yet known.

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For monolingual children who speak languages other than English, there are adaptations of the widely used *MacArthur-Bates Communicative Development Inventories* (*CDI)* in a number of languages.[1] There is considerable consistency across languages in children's early expressive language development. For example, about 85% of Spanish-speaking 24 to 26-month-olds are combining words and 90% or more of 24-month-olds have an expressive vocabulary of at least 40 words.[14]

Bilingual children's development of expressive vocabulary is comparable to monolingual children when parent reports for both languages are obtained and combined using either of two proposed methods. "Total vocabulary" in bilingual children (Language A + Language B) is comparable to or exceeds monolingual children's vocabulary size. "Total conceptual vocabulary," in which words with similar meanings (e.g., English "cat" and Spanish "gato") are counted only once, is comparable to vocabulary size in monolingual children.[15,16] In addition, age of onset of word combinations is similar for bilingual and monolingual children.[15,17,18]

Although pairs of monolingual forms can be used, there are also some bilingual adaptations of vocabulary checklists available, including Spanish-English[18] and German-English[15] adaptations of the *Language Development Survey* and a bilingual Spanish-English scoring adaptation of the *CDI*.[17]

Research gaps

Variation in findings across social groups and gender differences indicates that parent report tools and/or criteria for early identification may need adjustment for different populations. The rate of identification of SELD using parent report tools is much higher for children from lower SES families; cut-offs that yield about 10% of middle class children identify two to three times as many children from lower SES backgrounds.[19] Although children from low SES backgrounds are at somewhat higher risk for language impairment, these major differences in rate of identification raise concerns about over-identifying SELD among children from lower SES backgrounds. Children from minority ethnic backgrounds had lower average scores when SES was controlled for in one study, raising similar questions about the validity of parent report tools in culturally diverse populations.[19] Finally, when uniform expressive vocabulary and word combination criteria are used, more 2-year-old boys are identified with SELD,[1,9,20] raising a question of whether different criteria may be appropriate for boys and girls. Research comparing outcomes for boys and girls with SELD is needed to address this question.

Conclusions

Young children with expressive language skills that are approximately below the 10th percentile are at much higher risk than peers for persisting language problems, even though there is a wide range of outcomes and many children with SELD at two years of age are in the average range by four years of age. A variety of additional variables are associated with persisting delays, and parental concern about possible speech-language

[1] See also the MacArthur-Bates Communicative Development Inventories website. Available at: http://www.sci.sdsu.edu/cdi/. Accessed November 3, 2009.

problems is a key predictor of risk for language impairment.

Implications

Early childhood educators, health care providers and other professionals can identify risk for language impairment in young children based on parent-reported information. Immediate referral to a speech-language pathologist is recommended for children with slow expressive language development if the parents are concerned that the child has possible speech-language problems or when there are additional risk factors. On the other hand, if the parents are *not* concerned about the child's speech-language development and there are no additional risk factors, monitoring ("watchful waiting") is recommended for children who are not combining words or who have a small expressive vocabulary (under 40 words) at 24 months.

Children who speak languages other than English should be referred for evaluation if they are delayed in expressive vocabulary and onset of word combinations in their native language. Because expressive language development is comparable among monolingual and bilingual children, when bilingual children's development in both languages is taken into account, bilingual two-year-olds who are not combining and/or have small total expressive vocabularies should be monitored and/or referred for further evaluation.

Collaborative efforts between practitioners and researchers on large scale screening programs that combine screenings with follow-up evaluations are needed to refine and validate models for predicting persisting language impairment for children with parent-reported SELD, using other information about the child and family. These efforts should also include work to adapt, implement and validate measures for children from homes in which languages other than English are spoken, and for children from lower socioeconomic backgrounds.

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Services and Programs Supporting Young Children's Language Development

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Topic
Language development and literacy

Introduction
Developmental language disorders place children at risk for long-term social, emotional and academic difficulties.[1] Intervention programs vary considerably in terms of service delivery method and may include direct intervention by a speech-language pathologist (for individual children or groups of children) or indirect intervention in which the speech-language pathologist trains a caregiver to conduct intervention (parent training, consultation with early childhood educators).

Subject
This review describes parent-administered language intervention and its efficacy for children with receptive and expressive language disorders. In parent-administered intervention, parents become the primary intervention agents and learn how to facilitate language development in daily, naturalistic contexts. The parents themselves are the direct recipients of the speech-language pathologist's efforts and their children do not normally receive therapy from the speech-language pathologist concurrently. Parent-administered intervention differs significantly from *parent involvement*, in which children receive direct intervention from the speech-language pathologist and parents play a secondary but supportive role (e.g. observation of therapy sessions, informal suggestions for language facilitation, completion of home practice assignments).

Theoretically, most parent-administered language intervention programs adhere to social interactionist perspectives of language acquisition, which maintain that simplified, responsive language input provided by adults helps children make comparisons between non-linguistic and linguistic contexts and figure out the relationships among objects, actions, external events and words.[2] The hypothesis is that responsive input strategies influence children's developmental progress in pre-linguistic aspects of communication (e.g. joint attention/action, intentional communication acts), vocabulary and morphology (i.e. suffixes denoting plural forms, past tense verbs, possession, etc.), and early sentence forms. Responsive input strategies used in many well-known parent-administered language intervention programs [3-7] include:

(a) child-centred strategies (e.g. follow the child's lead, get down to the child's physical level, wait for the child to initiate);
(b) interaction-promoting strategies (e.g. encourage children to take turns in a conversation, ask questions and wait for a response); and
(c) language-modelling strategies (e.g. label, expand utterances, extend topics).

These and other strategies are described further in Tannock and Girolametto.[8] Some parent-administered programs also teach parents to target specific interaction and communication goals (e.g. pre-linguistic skills, vocabulary, two-word phrases, morphemes such as simple words and prefixes) using a focused stimulation procedure.[9,10] In focused stimulation, the targeted goal is repeated several times within an interaction and the focus is on increasing the child's receptive exposure to the form. The child is not asked to imitate the target. Other programs may include instruction on how to elicit target goals directly by requesting imitation of the target behaviour or asking a question that elicits the goal.[5,6] In the latter type of program, the children's productive practice of goals is viewed as a key language-learning strategy.

Parent-administered intervention programs have been used with late-talking toddlers between 18 and 30 months,[10,11] preschool-aged children with cognitive and developmental delays (e.g. Down syndrome)[12-15] and preschool-aged children with receptive and expressive language disorders.[16-18] Parent-administered interventions have also been used with children who have Autism Spectrum Disorder, but these studies are not included here (for a comprehensive review, see reference 19).

Problems

There are few well-designed studies that investigate the efficacy of parent-administered intervention and there are several concerns with the existing studies. First, the participants have generally been well-educated, middle-income parents who are English-speaking and highly motivated to participate in parent programs, raising the possibility of selection bias. Second, the sample sizes in these studies have been small and the focus has been on short-term communication and language outcomes for the children. Finally, there is no research to demonstrate the efficacy of this approach for families from lower socio-economic backgrounds or families from different cultural groups (for whom parent-child interactions may differ from the mainstream culture).

Research Context

Very few efficacy studies have been conducted in this area, due to a number of methodological issues that make stringent research methods difficult to employ. The research context provides the following challenges: (a) the number of participants is limited due to the costly and time-intensive nature of language intervention; (b) language intervention is an interaction between a practitioner and a family and maintaining treatment fidelity across multiple participants and sites is difficult to achieve; (c) traditional "blinding" methods cannot be employed because families are aware of treatment and control conditions; and (d) follow-up studies are difficult to conduct because long-term control groups are viewed as unethical.

Key Research Questions

Key research questions include the following: (1) Does parent-administered intervention result in better outcomes for children? (2) Is parent-administered intervention more efficient than traditional intervention? (3) For which parents and children does it work best?

Recent Research Results

Only experimental studies (i.e. randomized control trials or single subject designs) are summarized here.

Children with cognitive and developmental disorders

Included in this group are two- to five-year-old children, with a variety of etiologies (e.g. Down syndrome, chromosomal abnormalities, mild cerebral palsy, general delays in development), and language levels that range from pre-linguistic (non-verbal) communication to short sentences. Interventions that employed a general stimulation approach (i.e. no specific language goals) yielded significant improvements in social-communication skills (e.g. joint engagement, responsiveness, assertiveness) and frequency of communication.[12,20] In contrast, interventions that selected goals and employed focused stimulation or elicitation techniques induced changes in vocabulary size[13,15] and the use of multiword utterances.[14] None of these studies followed the families longitudinally, hence data describing longer-term outcomes for language, social and emotional development are not available.

Late-talking toddlers

These children are between 18 and 30 months of age, with non-verbal IQs in the normal range, no known sensory, motor or social-emotional problems, and are at the single-word stage of language development. Focused stimulation of vocabulary targets was utilized in these studies. Treatment effects were reported for a broad range of language measures, including vocabulary acquisition, development of multiword sentences, and speech sound development.[10,11,21] Girolametto et al.[21] examined outcomes for behavioural/emotional development and reported a reduction in externalizing behaviour as measured by the Child Behavior Checklist.[22] Only one study followed the toddlers longitudinally to five years of age.[23] The findings indicated that 86%[18] of the children originally identified as late talkers had caught up to their age-matched peers; 14% (three children) were identified as having language disorders.

Children with receptive and/or expressive language disorders

Several studies have examined the efficacy of parent-administered language intervention for preschool-aged children with receptive and expressive language disorders. All children had non-verbal IQs in the normal range and no known sensory or motor problems. These intervention studies included specific language targets for the children and demonstrated significant improvements in the acquisition of vocabulary,[24] morphology (i.e. word endings) and syntax (i.e. grammar).[9,18] None of the studies reported outcomes for social and emotional development.

Treatment comparisons

Only two comparisons of parent-administered intervention and traditional, clinician-administered therapy have been conducted.[9,18] In these studies, children in both interventions made equivalent gains in language development. Fey et al.[9] concluded that more consistent treatment effects were displayed by children in the clinician-administered intervention than in the parent-administered intervention. Baxendale et al.[18] reported that children with receptive *and* expressive language disorders made greater changes in the parent-administered intervention than children with expressive language disorders. The latter group of children had better language outcomes in the clinician-administered intervention.

Conclusions

Overall, the available research suggests positive outcomes of parent-administered intervention for a wide range of children with language disorders. Gains in language development appear most consistently in interventions that target specific goals. The children's short-term progress is an important finding, given that the untreated control groups did not make similar gains. No negative effects of this intervention have been reported in the literature. However, little is known about longer-term effects of parent-administered language intervention. Replication studies employing larger numbers of subjects would further contribute to our knowledge of outcomes. Future projects should also investigate the long-term impact of parent-administered intervention and family/child characteristics that may influence outcomes.

Implications

Parent-administered intervention is a viable model of language intervention for promoting short-term developmental progress in communication and language skills in preschool-aged children. This service delivery model is cost-effective, requiring less than 50% of the clinician's time.[9] Practitioners utilizing this model must carefully monitor children's progress to provide adjustments or alternative interventions if gains are not observed. General access to the content of parent-administered interventions should be available in a variety of comprehensible formats for families whose commitment precludes them from participating in a formal program (e.g. parent education materials, Web sites). More evidence-based data is needed before wide-spread adoption of this intervention model is recommended for families from diverse linguistic and cultural backgrounds.

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Programs Supporting Young Children's Language Development

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Topic
Language development and literacy

Introduction
The purpose of this paper is to provide current research findings and recommendations on programs and intervention approaches that promote young children's language acquisition. The paper focuses on children from birth to five years of age with mild to severe language delays or disorders, including at-risk children. Following a discussion of some current challenges in the field of early language intervention, we describe recent progress in meeting these challenges and present an emerging early language intervention model. We then summarize important research findings related to evaluating program outcomes, measuring the impact of effective programs on children's language development, and fostering adult (eg, parents, caregivers, early interventionists) participation at home and in the community. The paper concludes with a discussion of the implications of these language intervention and research issues for families, policy-makers, and the general public.

Subject
We know that children with delayed or disordered language are at increased risk for social, emotional, and behavioural problems.[1,2,3] Based on the assessment results of over 200 preschoolers attending Head Start programs, Kaiser and colleagues found that compared to their peers without behaviour problems and average social skills, preschoolers with behaviour problems had lower receptive and expressive language scores, and below-average social skills.[4] Research also suggests that preschool children with delays in communication, particularly those with significant receptive deficits, are less likely to be socially accepted among their peers and have reciprocal friendships.[5] Although much more research is needed to better understand the relationship between children's language acquisition and social emotional development, early language intervention programs that utilize the most effective intervention approaches will likely impact children's later communication and social performance.

Fortunately, remarkable achievements have been reported in the early detection of language delays and disorders,[6,7] and in our knowledge of contexts/settings, programs,

and approaches that enhance optimal language development. From this large body of literature, critical components of comprehensive early language intervention programs have emerged. Recommended language teaching strategies include:

1) *prelinguistic milieu teaching (PMT)*[8,9]
2) *milieu teaching*, which consists of incidental teaching[10] and mand-model procedures[11]
3) *responsive interaction approaches*,[12,13] including growth recasts,[14,15]
4) *direct teaching* of specific language targets using adult directed strategies (See reference 16.).

A brief definition and overview of each of these strategies is provided below. The above references provide more detailed descriptions for interested readers.

When planning language intervention programs, providing ideal situations and contexts for language learning that supports the use of various effective approaches is of utmost importance. For example, enabling contexts[17] that set the stage for and support language learning within caregiver-child interactions, include:

a) creating communication opportunities (eg, keeping toys out of reach, violating expected routines) and face-to-face positioning
b) following the child's lead by providing activities or toys that interest the child
c) building and establishing social routines (eg, rituals such as peek-a-boo or pat-a-cake).

Similarly, routines based interventions provide an ideal scaffold and context for teaching.[18,19] That is, predictable and familiar routine events are used to facilitate child responses, and offer families and caregivers many teaching and learning opportunities throughout the day. Within enabling contexts and routines based instruction, one can use any of the milieu teaching, responsive interaction, direct instruction or direct language teaching approaches described below to promote functional language learning in natural environments.

Once the social interaction environment is arranged, the adult can then provide specific teaching techniques to prompt (eg, time delay and verbal prompts), model (vocal or gestural models of desired communicative responses) and reinforce (eg, acknowledge the child's intent/meaning by naming things the child refers to) clear, intentional communication attempts within child-centered play routines. These strategies are called '*prelinguistic milieu teaching techniques'*, and are used to help children who are not yet speaking to transition from preintentional to intentional communication, and from presymbolic to symbolic communication.

Milieu teaching approaches consist of several specific teaching techniques embedded within a child's ongoing activities, interactions, and social routines (The term "milieu" means environment.). Two of these techniques are called mand-model and incidental teaching procedures. Mands are typically adult questions, commands or directives. Using this strategy, an adult would initiate the teaching episode by asking a question that would require a specific response (or target skill) from the child (eg, a ball is up on the shelf and the adult says, "What do you want?"). In an incidental teaching episode, the adult waits for the child to initiate communication (verbally or with gestures), then prompts the target

response by requesting a more complex child response (eg, the child reaches for the ball, and the adult says, "Can you say ball?". Common features of these procedures include:

a) following the child's lead

b) arranging the environment (eg, placing toys out of reach) to indirectly prompt child productions or to directly prompt child with more explicit mands (eg, asking questions like "What do you want?", or asking a child to imitate (eg, "Can you say 'cookie'?")

c) natural social consequences (eg, access to a desired toy through adult assistance)

d) targeting specific language skills (eg, early word combinations such as agent + action — "Daddy eat," or action + object — "Throw ball"); vocabulary; gestures to request or comment.

Responsive interaction includes teaching caregivers to be highly responsive to the child's communication attempts by following the child's lead, waiting for the child to initiate, responding to the child's focus of attention by commenting on actions or toys of interest and modeling language (eg, labels, expansions, extensions).

Direct teaching is characterized by prompting, reinforcing, and giving immediate feedback on grammatical or vocabulary targets within highly structured and scripted sessions. Recasting and direct teaching approaches are particularly suited for children at risk or with minor speech and language delays. A recast occurs when the adult expands or modifies a child's utterance by adding new syntactic or semantic information.[20] Recasts may help children make comparisons and distinguish differences between their own utterance and the adult's recast of that utterance, which may facilitate acquisition of new grammatical or semantic structures.[12]

Problems

We have made substantial progress in identifying the early predictors of later language development (eg, babbling, showing, giving, and requesting objects using gestures and vocalizations, and vocabulary comprehension;[21]), and documenting approaches that can lead to enhanced language outcomes for young children. However, many challenges remain. One of the primary challenges will be to move research findings into everyday practice. Over 70% of children ages 3–5 years identified with a disability have delays and disorders of communication and language development,[22] and this is the single most common reason for special education referral.[23] Only a few comprehensive assessment tools exist (eg, Communication and Symbolic Behaviour Scales[24]) to measure deficits or delays early in development, and the tests that are available are not widely used by clinicians. Language deficits beginning in early childhood can have a ripple effect throughout a child's life, which may directly or indirectly affect social opportunities, career options, and an individual's overall quality of life. To remediate these deficits early on, widespread training is needed for early interventionists, parents, and childcare practitioners on how to use responsive interaction styles and other effective intervention practices in day-to-day early intervention and home settings.[25,26] The need to address this challenge is heightened by recent evidence demonstrating that some teaching strategies by themselves may not be sufficient to ensure optimal language outcomes,[27,8] various

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approaches may be more effective at different points in a child's development,[28] and the context or type of activity (eg, play-dough, book reading) can strongly influence level of caregiver responsiveness.[29] Another challenge in language development is the lack of resources and support needed to provide children with daily opportunities to interact with highly responsive adults; and if necessary, receive additional language stimulation approaches (eg, direct instruction, one-on-one sessions) from trained early interventionists.

Research Context

Over the past three decades, numerous studies have been conducted to develop and examine different procedures or treatment "packages" to enhance the communication and language development in children with mental retardation and developmental disabilities. The movement towards basing treatment and educational practices for young children on empirical evidence has resulted in a number of exemplary reviews summarizing speech and language interventions for children with more severe language deficits associated with autism (eg,[30]), trends in intervention research (eg,[31]), and evidence-based practices in the field of early intervention/early childhood special education (eg,[32]). The majority of experimental research documenting treatment effectiveness for enhanced language and social outcomes is based on single-subject research methods, involving small numbers of children over limited periods of time. Although few in number, empirical data are emerging on the effectiveness of recommended language intervention procedures following larger scale descriptive and comparative, longitudinal intervention studies that (in some recent cases) employ true experimental designs with random assignment of subjects to contrasting treatment conditions.[33,28,8,34] This impressive body of research provided a framework for a developmental model of fostering early communication and language development. This developmental model

1) views the rate and quality of language input a child receives as crucially important for their optimal development

2) supports the use of different approaches at different stages in a child's development based on the nature of the intervention goal.[27]

For young children with more significant social and communication disorders (eg, autism), this would include attention to learning style and temperament.

Key Research Questions

What differential effects do the recommended communication interventions have on young children's language development?

How should programs and services be evaluated?

How do we move recent research findings and developmental models of language interventions into widespread practice?

Recent Research Results

Recent research suggests that if the average length of a child's spoken utterance, that is their Mean Length of Utterance (MLU), is greater than is 2.5, responsive interaction approaches are more effective than milieu teaching; and milieu teaching strategies are more effective for children with an MLU below 2.0.[35,28] Milieu techniques may be more effective at this point in a child's development due to limitations in attentional and

memory resources necessary to learn from responsive interaction approaches such as recasts and expansions. For children who are not yet talking, language intervention targets should include critical communication skills that typically develop during the first year of life and contribute to later receptive and expressive language development.[36,9,34]

In the first and only randomized experiment examining the effect of two prelinguistic communication interventions, Yoder and Warren[34] reported that children with highly responsive and more educated mothers benefited the most from prelinguistic milieu teaching. Children with less responsive mothers who had lower levels of formal education benefited most from a modified responsive small group intervention in which the adult followed the child's lead and responded to his communication attempts, but did not use communication prompts and imitation. Intentional communication occurs when a child uses

a) coordinated joint attention to direct an adults' attention to an object using unconventional gestures or vocalizations, or

b) uses conventional gestures or words to communicate (eg, requests or comments to an adult).

For children between birth and two years, or children who are not yet speaking (ie, prelinguistic), research demonstrating improvements in intentional communication have important implications for those who show clear delays in these critical early communication skills, and those at risk for language delays or disorders associated with (for example) mental retardation.[37,38] For children with autism spectrum disorders, effective interventions provided before 3 years of age can have a more significant impact on early social, communication, and behavioural skills than if intervention is provided after age 5.[39]

Now that we have strong evidence on specific language intervention techniques that can enhance language acquisition in young children, how do we ensure the fidelity of these treatment approaches in early intervention and home programs, and what outcomes do we measure to assess program effectiveness? Investigators of language and social communication interventions for children with disabilities have begun to emphasize the importance of multiple outcome measures, that not only assess changes in isolated target skills, but also are ecologically valid and attend to caregiver and consumer perceptions and concerns.[40,41,7] Fortunately, a review of trends in intervention research over the last 20 years by Dunlap and colleagues suggest that more studies are now focusing on children ages 0 to 5 years, with researchers spending more time in regular education using more typical social contexts.[31] These authors also reported an increase in social validation measures, but only within recent years. Future research should make a concerted effort to continue on this path by

1) creating additional assessment tools to identify infants and toddlers with language delays or disorders, or those at risk

2) collecting data in multiple contexts and across multiple conversational and play partners

3) measuring meaningful changes in child and adult outcomes, and the relationship between specific approaches and child–family characteristics

4) evaluating and responding to the needs of teachers, caregivers, early interventionists, and other team members.

As greater emphasis is being placed on basing early language intervention services on empirically supported practices, and defining early learning standards,[42] it will be essential for researcher and practitioners to work together to move research findings into day-to-day practice. This move will require a transdisciplinary approach, with a more concerted and determined effort by all adults invested in the child's development. Identified family activities, caregiver routines, and school play times can be used to assess children's prelinguistic or linguistic development, with planned responsive interventions embedded in these natural environments. Children may also require direct instruction to learn advanced or higher-level language skills (eg, parts of speech such as past tense verb markers or irregular plurals, and more abstract language concepts) through multiple trials, prompts and reinforcement. Developing effective interventions based on the developmental model of early language interventions will require continued research, examining the relative efficacy of different language intervention approaches, and between specific approaches and individual child characteristics. To this end, highly trained scientists will have to conduct well-designed, comparative and longitudinal intervention studies with randomly assigned, matched control samples.

Conclusions

A developmental model of communication and language intervention has been proposed, based on which specific types of adult input are most effective at various points in a child's development. This model assumes that no one strategy or treatment package will be appropriate to enhance or remediate the wide range of skills children need as they progress from prelinguistic communication to more sophisticated linguistic development and reading. It is likely that a continuum of language intervention strategies may be necessary, such as elicited production prompts, models, and contingent adult input to improve early receptive and expressive vocabulary and 2- to 3-word semantic relations for young children; and using growth recast techniques, responsive interaction techniques and direct teaching to facilitate the acquisition of new semantic and syntactic forms for children with higher language levels. These approaches are likely to be particularly effective for children with developmental disabilities and language delays or disorders when provided within highly responsive environments and surrounded by adults (eg, parents, childcare workers, and early interventionists) with responsive interaction styles. Future research aimed at longitudinal, comparative analysis of the relative efficacy of different treatments and between (for example) a specific treatment and learner characteristics, treatment goals, and the instructional context will assist in refining and confirming this developmental model. These types of research may lead to cost-effective, implementation of optimal interventions with sufficient intensity to affect a child's language, social and emotional development trajectory as much as possible.

Implications

Issues of early identification and comprehensive assessments, and providing highly responsive environments early on must be addressed by changes in social-policy initiatives. Further development and the day-to-day implementation of effective language

approaches and ongoing measurement of impact on children's social development and emotional well-being will require a commitment to programs that support service delivery to young children (eg, Part B and C of US federal and state-funded agencies), and the provision of substantial resources to support the work of highly trained scientists. For example, as the intensity and treatment needs increase for children ages 3 to 5 years, additional funds should be available from Part B early intervention programs, to prepare children to meet the cognitive, linguistic, and social demands of the elementary school years and beyond. Given the critical role language and social development play across a life span, and the increased potential for child and family success, translating early language intervention research into widespread practices is an essential and achievable immediate goal.

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Services and Programs Supporting Young Children's Language Development: Comments on Girolametto, and Thiemann and Warren

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Topic
Language development and literacy

Introduction
Language delays and disorders are an important issue in child development. Beyond the number of young children with language disorders, the long-term impact of such disorders increases the importance of programs to support young children's language acquisition. Children with early language disorders are at risk for social and behavioural problems as well as academic failure, including literacy difficulties.[1] Furthermore, most school-aged children diagnosed with learning disabilities have language as a component of their learning disability.[2] In broader societal terms, estimates have been made of the economic impacts of low language and literacy achievement.[3] Thus, the topic of these two texts is an important one for children and their families, and for society at large. Girolametto, Thiemann and Warren are among the most influential researchers in the area of treatment programs for language disorders in young children. In these papers, Thiemann and Warren conduct a broad review of the evidence for early language intervention while Girolametto specifically focuses his review on research into parent training programs.

Research and Conclusions
Thiemann and Warren highlight the social consequences of a language disorder and then proceed to discuss evidence of effective language intervention. They briefly summarize four different language-teaching strategies that have been demonstrated to improve children's language abilities. Their discussion of the area is particularly useful because they provide a model of language intervention that accommodates these various approaches. Thiemann and Warren argue that effective intervention requires the provision of ideal language-learning situations, which involve providing communication opportunities, following the interests of the child and building predictable, familiar routines. Within an enabling context, the adult can use specific techniques from any of the four language-teaching strategies. Thiemann and Warren review evidence showing some factors that may determine which approach is most effective, including developmental level and parent responsiveness.

Girolametto's review of parent-administered language intervention programs identifies the same basic principles and range of language teaching strategies as Thiemann and Warren, although different terminology is sometimes used (e.g. focused stimulation rather than responsive interaction). He reports on literature showing the effectiveness of parent-administered intervention for children with language delays/disorders with and without additional intellectual disabilities. Girolametto notes that programs that involved a focus on specific language targets resulted in greater gains in language than those that did not have such targets. He reports that there is evidence that, as a group, children involved in parent-administered programs make equivalent gains to those in clinician-administered ones. However, these gains may be less consistent on an individual level and influenced by the nature of the child's language profile. Thus, he concludes, while parent-administered programming is a viable, cost-efficient approach to providing services, the child's progress must be carefully monitored.

Not only do the two articles present a similar fundamental approach to language intervention, they also identify similar limitations in current research and areas for future research. As the authors note, a "one size fits all" approach to language intervention will not work. While there are fundamental components that are central to all the early language intervention programs reviewed, there are many child and parent variables that will affect a program's effectiveness. In the papers, the authors discuss some of the factors (e.g. developmental profile, language targets, responsiveness of parents, linguistic and cultural background), but there are other likely factors, such as child temperament and intervention context, that also need to be explored.

Girolametto's review explicitly discusses one intervention context – parent training. Although Thiemann and Warren's review cites studies that used a variety of intervention contexts, they do not discuss this variable in explicit terms. There are at least four general contexts in which language intervention can be provided: individual, small group, classroom and caregiver training. All of these are viable contexts, but much remains to be learned about which is the best approach for which children and families at any point in time. For example, for many "at-risk" children, providing a high-quality preschool with a language-focused curriculum may be sufficient, but some children may require more focused individual or group programming. These contexts can also be combined. Girolametto makes the distinction between parent-administered intervention and parent involvement, in which the parents play a secondary, supporting role in clinician-administered intervention. This is an important distinction, as we should not assume that observing therapy or getting general language facilitation suggestions will be sufficient to enable parents to modify their interactions in facilitative ways. However, a parent-training program could be offered in conjunction with direct services. This may well be the most effective and efficient combination for some children. In order to identify which intervention context or combination of contexts are effective for particular children, additional research is needed.

Both papers note that most of the evidence available speaks only to short-term effects and that there is a need for longitudinal research to document treatment effects over the long term. One long-term effect that is briefly alluded to in the papers but needs closer examination is the ability of early language intervention programs to prepare children

with language disorders to meet the language challenges of school, particularly the development of literacy. Thus, preschool language intervention needs to be concerned with and evaluated on its effects in areas such as phonological awareness, narrative abilities and emergent literacy skills, which are all foundations for literacy acquisition.

Finally, the authors call for additional work on the transfer of research findings into practice and policy. This is a critical step that requires specific attention. As Girolametto notes, the parents involved in efficacy research are generally not representative of the population. Similarly, the children and settings involved in a research study are often not typical, or at least are not representative of the full range of children with developmental language disorders and intervention contexts. Once an approach has been shown to be effective in a controlled research study, it is necessary to determine that similar effects can be achieved in average treatment settings.

Implications for the Development of Policy

Given the social, educational and economic impacts of developmental language disorders, it is clear that services for children with such disorders need to be a priority. As noted in both papers, research has shown that we can impact child outcomes. The research reviewed by these authors demonstrates that within a responsive environment, a variety of specific intervention techniques can be effectively used by clinicians, preschool teachers and parents. If we are to provide the support children and their families need, it is vital that adequate funding of the full range of intervention contexts – individual, small group, parent training and preschool-based – be provided. Further, appropriate preservice training and continuing education need to be provided to everyone who works with the children and their families. This includes speech-language pathologists, early interventionists, early childhood educators and child-care providers.

In developing intervention programs, we need to be concerned about effectiveness and efficiency. As Girolametto notes, parent-administered intervention has been shown to be an effective intervention option that is cost-effective. However, he notes that there is evidence that the gains made by children may be more variable than those made by children receiving clinician-directed intervention and that little is known about the effects of this type of intervention with families from diverse cultures. Thus, more research is needed to establish for which children and families this cost-effective approach is the best option. Girolametto calls for the content of parent-administered interventions to be made widely available for those who cannot participate in a formal program. Such initiatives can be useful and it is important to provide all parents with information on language facilitation. However, it is not known what effect the provision of information alone will have, and it is unrealistic to assume that this will meet the needs of a child with a language disorder. Evidence that programs with specific language targets are more effective than programs with a more general facilitation approach, and findings that parent responsiveness is a factor in program outcomes suggest that the provision of information will not be sufficient. Thus, for parents who are unable to participate in a formal parent program, alternative intervention options should be available.

Although our current knowledge allows the development of effective interventions, there is still much to be determined if we are to develop programs that enable children to

achieve full potential. Therefore, it is important that there be sufficient support for programmatic efficacy research. Efficacy research is difficult and expensive to conduct, but only by gathering more evidence-based data will we be able to determine the best match between child, family and intervention program. As additional evidence is gathered, it is essential that the knowledge transfer occurs, ensuring that research findings are incorporated into practice. This will necessitate support for the integration of findings across multiple studies in a manner that makes the research accessible. Coordinated efforts among researchers, service-providers and policy-makers are crucial if we are to develop effective and efficient early language intervention programs.

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