

WINTER, 2008

ON THE uptake



HOT TOPIC: Not so specific language impairment

Why are Researchers so Interested in SLI?



Specific language impairment (SLI) has been the focus of extensive research in recent years. The very fact that language can be impaired selectively is seen as indicating that it must be controlled by a linguistic mechanism, which appears to operate fairly independently. Children with SLI are seen as providing a unique opportunity to examine this mechanism. SLI research thus addresses one of the most fundamental questions in language acquisition: the relationship of lan-

guage and cognition. To be diagnosed as having SLI, children must present with a significant impairment in language, while at the same time demonstrating development within normal limits in all other areas of development, including notably, nonverbal cognition as well as sensory and motor development. This strict diagnostic definition is commonly used in research to ensure a focus on language impairment that can be viewed as being unexplained by factors outside of language. Clinically, however, children with SLI form a relatively small subgroup of the larger group of children with developmental language impairment which can be of many causes and more often than not includes other developmental concerns or other diagnosed impairments. For

the clinician, it is, therefore, important to understand how SLI fits into the clinical picture, what research on SLI has revealed about the nature of language development and disorders, and to what extent research on SLI is relevant to other clinical groups.

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Presented by/présenté par:



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What is the Clinical Relevance of SLI Research?

The demonstration that persistent language impairment can occur in the absence of more global developmental impairment was not only of major theoretical significance, but was also of great importance clinically. Language impairment in children, when not accompanied by other clinically identifiable deficits, can be hard to identify and historically went unrecognized for a long time. Still today, a debate is ongoing concerning what it takes for a developmental language impairment to count as “real” and when a “delay” is significant enough to be called “impairment”. The vast research base on SLI has contributed to a greater recognition of language impairment in and of itself as a real impairment that must be identified and treated as early as possible to prevent severe and long standing consequences. Longitudinal studies have demonstrated that SLI diagnosed in the preschool years persists at least into adolescence in the majority of cases. As well, studies on so called “late talkers” – children who present with early important language delays which may or may not persist – has helped clarify the criteria for accurate early diagnosis.

A Diagnostic Category That Relies Solely on Language Measures

The accurate identification of SLI, however, requires refined diagnostic methods. Unlike language impairments that present as part of a more global deficit or syndrome, the presence of an impairment that affects primarily language is documented solely by language tests, and thus requires that such tests be available. Two main methods are typically used in the diagnosis of developmental language impairment: a quantitative method which compares the language performance of children in various domains of language to norms reflecting the typical performance of

normally developing children of the same age. Standardized tests are typically used for this purpose. The other method relies on a more qualitative approach, identifying specific behaviors which have been shown to be characteristic of the disorder, referred to as clinical markers. A well known behavior proposed as a clinical marker for SLI in English-speaking preschool children is the optional use of infinitives in contexts requiring verb inflection. Research on the applicability of this marker to other languages has yielded mixed results. The search for reliable clinical markers has proven to be difficult. Thus, the preferred method for diagnosis remains the careful use of standardized tests. This method allows a focus on various domains of language, which recognizes that although SLI may include some characteristic linguistic behaviors affecting particular linguistic structures, it does primarily involve a generalized language impairment which tends to affect most or all domains of language.

SLI and Diagnostic Categories in Effect in Quebec

The specific diagnostic criteria used must be selected based on research supporting their accuracy. However, the specific diagnostic criteria in place in various settings and geographical locations differ to some extent, reflecting the interpretation of research as well as administrative decisions. The severity level typically required for clinical diagnosis ranges between a result of 1 to 2 standard deviations below the mean on a standardized test. In contrast, the level required for research purposes is often less severe, or 1 standard deviation below the mean. No diagnostic category currently in effect in Quebec corresponds exactly to the category labeled SLI in the research literature. The Quebec category which most closely resembles SLI is that of “dysphasie”. However, although the dysphasie category is not currently specified in terms of a cut off criterion in relation to norms, it can be in-

ferred that the identification of “dysphasie sévère” requires a greater severity of symptoms than does SLI, as it is specified that both comprehension and production must be affected (SLI may affect production only), and the impairment must be shown to persist over a period of time. As a result, many of the children identified according to Quebec criteria as “at risk (à risque)” or presenting with “significant delays (retard du langage or hypothèse de trouble)” also correspond to children who would be identified in the research literature as having SLI. The categorization used in Quebec is based on a relatively old classification scheme which is no longer in wide use elsewhere and has been the subject of efforts aiming to revise it. Another important factor to consider in the diagnosis of Quebec children is the lack of norm referenced tests in French, precluding diagnostic decisions based on quantitative measures and relying instead on qualitative analysis of error patterns. It is important in this respect for clinicians to carefully consider the validity of these clinical markers. Cross-linguistic research has indicated that the manifestation of SLI varies considerably between languages, thus a marker that is characteristic of one language is not necessarily valid in another language. As well, many of the clinical markers which have been popular in clinical practice, such as examination of pronoun use, have not been verified by systematic research. Thus, their validity as indicating the presence or absence of language impairment is currently not supported by research. Due to the lack of appropriate assessment methods for the French language, many clinicians also customarily employ translations of English tests, offering a comparison to English norms “for information purposes”. Although it is understood that this method evolved as a last resort given the lack of appropriate measures, it is important for clinicians to keep in mind that languages differ in their developmental sequence. Therefore, comparison of the results of a French-speaking child to English norms in fact offers no information at all, and can in many cases be

misleading. It would, therefore, be preferable to avoid comparisons to such inappropriate norms.

In recent years, several standardized tests have been developed for French. Some of these have been developed and normed for European varieties of French, but may have applicability to Quebec populations to the same extent as English tests developed in other parts of North America and in England. Important research efforts are underway as well by Quebec researchers to develop assessment tools and normative databases specifically targeting Quebec children. Many of these research projects are detailed below. Projects recently completed or underway provide normative information on the development of the lexical and grammatical development of French-speaking children in Quebec from preschool age to early school age. As well, a recent study investigated the diagnostic accuracy of a number of measures, including measures focusing on linguistic knowledge and ones focusing on linguistic processing. This study will also include an evaluation of the prevalence rate of SLI among 5-year-old children in Quebec. In addition, studies focusing on French-speaking children with SLI continue to provide a more refined description of the characteristics of SLI in French-speaking children of various ages, showing how SLI in French resembles as well as differs from SLI in other languages and at the same time shedding light on its underlying causes and allowing evaluation of potential clinical markers. With the important research efforts currently underway, major improvements in the diagnostic evaluation of French-speaking children will be possible in the near future.

The "Specific" in SLI Revisited

The feature of SLI underlying its immense popularity among researchers is the apparent dissociation between language and cognition. Interestingly, as research data accumulate, this very feature has been called seriously into question. Indeed, there is growing

evidence that although children with SLI present with nonverbal cognition within normal limits as measured by clinical tests, more subtle cognitive deficits are evident when more sensitive measures are used. Thus, whereas certain accounts of SLI postulate the underlying cause to involve specific deficits in the linguistic system, other accounts have been proposed that postulate deficits not in specific linguistic rules, but in the processing of linguistic information, or in the processing of information more generally. The clinical significance of this is, for example, that effective treatments for SLI might target processing skills and efficient handling of information. Further, similar findings apply to other developmental domains which must be shown in SLI to be within normal limits on clinical tests. Thus, on closer scrutiny, children with SLI have been found to present with subtle impairments in other developmental domains, which are less pronounced than the linguistic deficit and may not be sufficiently severe to warrant a diagnostic label, but may nevertheless contribute the child's functioning in important ways. As an example, a recent study conducted in Montreal (see below) documented motor deficits in preschool children with SLI, underscoring the importance of careful examination of all developmental areas even when language is the primary presenting factor. Another implication of research comparing SLI to children with a more general type of language impairment is that there is growing evidence that the nature of the language impairment found in children with SLI is not fundamentally different from the language impairment found in children who also present with cognitive impairment. Clinically, a distinction is often made between such groups. For example, in children who present with a language impairment secondary to another primary diagnosis such as Down syndrome or autism, it is often assumed that the language impairment is subsumed by the more global impairment and involves something different from the type of language impairment seen in SLI. Often children with Down syndrome do not receive SLP

services directed at their language as they are seen as less appropriate candidates for such services than children with a primary language diagnosis, or it is assumed that a more general developmental intervention is sufficient to cover their language needs. This view is not in line with current research, which shows that children with Down syndrome have a language impairment of a type similar to SLI, and that their language impairment typically exceeds the extent of their cognitive impairment, thus indicating an SLI component to their deficit.

To conclude, research on SLI has provided much invaluable information on the characteristics of a primary language impairment in children, refining our definitions of a what is considered a normal delay in acquisition, versus a persistent impairment. Although this research is focused on a relatively restricted subgroup of children who are not typically seen as standing out as a clinical category, it turns out to have major clinical implications for children with primary language impairment as well as for much larger group of children with developmental language impairments of various causes which may include other deficits or in which the language impairment is secondary to another diagnostic label.

- Dr. Elin Thordardottir

KEY REFERENCES:

- Leonard, L. (1998). *Children with specific language impairment*. Cambridge, MA: The MIT Press.
- Tomblin, B., Records, N., Buckwalter, P., Zhang, X., Smith, E., & O'Brien, M (1997). Prevalence of specific language impairment in Kindergarten children. *Journal of Speech, Language and Hearing Research, 40*, 1245-1260.

COMMENTARY

Emerging in the last few years is the realization that developmental language impairment (DLI) involves more than simply delays in language skills. Due to the pre



ponderance of both concern and evidence for language impairment, difficulties in other areas appear relatively subtle and are often overlooked initially

and at follow-up. In a study conducted at the MCH/McGill University, a group of preschool children diagnosed with DLI who were reassessed four years after original diagnosis, developmental (what a child can do) and functional (what a child does do) limitations were noted in all domains (motor, social, cognitive, activities of daily living) evaluated for the group as a whole. While the language difficulties were still most apparent, the limitations in the other domains exceeded that which would warrant clinical concern. In addition this study confirms that more than merely a maturational lag or delay in language skills existed in children with DLI. They did not "catch-up" in this core domain. In a second study conducted by the same investigators, detailed testing in a group of newly diagnosed school age children with DLI revealed that a majority had significant motor difficulties, especially pertaining to fine motor tasks that are particularly relevant to academic skills. In both studies, prediction of which child with DLI would experience significant difficulties in other domains was not consistently possible. These results should serve to broaden the scope of assessments and interventions

offered to children with DLI and modify our prognostic expectations and follow-up protocols.

- Dr. Michael Shevell

KEY REFERENCES:

Webster, R.I., Erdos, C., Evans, K., Majnemer, A., Kehayia, E., Elin Thordardottir, Evans, A., Shevell, M.I. (2006). The clinical spectrum of developmental language impairment in school-age children: Language, cognitive and motor performance. *Pediatrics*, 118: 1541-1549.

EMERGING EVIDENCE

...In Progress

Title: *Morphometric MRI of Children with Specific Language Impairment.*

Description: This study undertaken as part of the MCH-Research Institute funded post-doctoral fellowship of Richard Webster, an Australian pediatric neurologist (Westmead Children's Hospital, Sydney, New South Wales, Australia) utilized advanced magnetic resonance imaging techniques

available at the Brain Imaging Center of the Montreal Neurological Institute to carefully quantify different regions of the brain in school age children with well-defined DLI compared to normal controls. The study has been completed and the data is presently under detailed analysis.

Investigators: Shevell, M., Erdos, C., Majnemer, A., Elin Thordardottir, Webster, R.,

Evans, A., Evans, K., Kehayia E.

Funding: REPAR

Title: *Développement d'outils diagnostiques et étude préliminaire de prévalence provinciale.*

Description: This is a three-phase study funded by the Ministry of Health and Social Services in 2004 and is currently on-going. It addresses francophone children living in Quebec with an average age between 4 and 5 years and 6 months and has the following goals: 1) to describe the language abilities in these children; 2) to develop the necessary screening and diagnostic tools validated and pilot tested with this population and 3) to conduct a preliminary provincial prevalence study. To date, Phase I and II have been completed and a series of diagnostic tools and scoring procedures have been identified as appropriate for detecting the specific language deficits in these children. These tools are the basis for the third and last phase of the study for which we are now in the process of recruiting participants from the Montreal and Quebec City area.

Investigators: Elin Thordardottir, Kehayia, E., Lessard, N., Majnemer, A., Mazer, B., Sutton, A., & Trudeau, N.

Funding: Ministère de la santé et des services sociaux



Title: *Effect of bilingual exposure on lexical and syntactic development in French and English.*

Description: This study examines large samples of preschool children acquiring French and English simultaneously and compares their language development to that of monolingual children. The purpose of the study is to document typical language acquisition of the bilingual children in lexical and grammatical domains and to relate their linguistic progress to their pattern of bilingual exposure. The study also includes evaluation of working memory abilities and includes a study of bilingual children with SLI. The results of the study will have important implications for the assessment of language impairment in bilingual children. Parts of this study are directed by Mahchid Nazami, Doctoral Candidate.

Investigators: Elin Thordardottir

Funding: SSHRC 2006-2009.

Contact for recruitment: (514) 398-6673 or elin.thordardottir@mcgill.ca

Recruitment Details: Normally developing children and children with SLI who speak either French only, English only, or French and English. Age range: 2 ½ to 3 years and 4½ to 5 ½.

Title: *Efficacy of two treatment approaches for the remediation of language impairment in bilingual children.*

Description: This study uses a randomized control trial design to compare the efficacy of a bilingual and a monolingual treatment method for bilingual children. Each of these treatments is also compared to a no-treatment condition, involving delayed treatment. The study targets preschool children with primary language impairment who come from homes where neither English nor French are spoken routinely (an "allophone" population) and thus involves children speaking a variety of home languages. Intervention is provided in French only, or bilingually in French and the home language. The study is conducted in collaboration with the Montreal Children's Hospital (Elaine Pelland-Blais) and the Jewish Rehabilitation Hospital (Suzanne Ménard). The study is conducted with the participation of

Geneviève Cloutier, Doctoral Student.

Investigators: Elin Thordardottir, Rvachew, S. & Sarkar, M.

Funding: CLLRNet, 2006-2009.

Recruitment Details: children age 3 to 5 years who present with language impairment or suspected language impairment based on a significant delay in the development of their first language. The children should routinely be exposed to a language other than French or English at home, but need to possess some proficiency in French (such as attendance for 6 months or more at a French speaking daycare setting).

Contact for recruitment: (514) 398-6673 or elin.thordardottir@mcgill.ca

Title: *Evaluation of the concurrent validity of the Pediatric Evaluation of Disability Inventory (PEDI) on motor skills in pediatric clients in the language deficiency program.*

Description: The aim of this study is to determine whether a screening tool, the *Pediatric Evaluation of Disability Inventory (PEDI)*, is sensitive enough to detect motor difficulties in children with language impairments. Forty children admitted to the language deficiency program at the Jewish Rehabilitation Hospital (JRH) are being evaluated by the clinical coordinator upon admission using the PEDI (gross motor and fine motor domains). They are also tested by an occupational therapist on the Peabody Developmental Motor Scales - Second Edition (PDMS-2), a comprehensive and precise measure of motor abilities. We will compare the results of the PEDI motor domains and the PDMS-2 to determine if the PEDI is useful to screen for children with language deficits who require motor intervention.

Investigators: Mayrand, L., Mazer B., & Ménard, S.

Funding: Jewish Rehabilitation Hospital Foundation

Title: *Rehabilitation services for preschool children with primary language impairment: individual versus dyad intervention.*

Description: Children often experience long waiting times to receive rehabilitation intervention and the

treatment offered may not be of optimal intensity. New approaches to rehabilitation service delivery are therefore necessary in order to provide quality care. The primary objective of this study is to compare the effectiveness of two rehabilitation service delivery approaches for young children with primary language impairment: one utilizes dyads (two children to one therapist) and the second uses traditional individualized intervention. Ninety-two children (3 and 4 years of age) with primary language impairment, referred to the pediatric rehabilitation program at the Jewish Rehabilitation Hospital (JRH) will be recruited and randomly allocated to either the dyad intervention group or the individual intervention group. Children in the dyad intervention group will be paired with another child and will receive interventions together with their dyad. Children in the individual treatment group will receive traditional individual intervention. After completing the 12-month treatment program, each child will be reassessed using measures of developmental progress, adaptive behavior, as well as parent satisfaction with care. This study will provide information on the effectiveness of an efficient approach to rehabilitation services.

Investigators: Mazer, B., Majnemer, A., Feldman D., Lach L., Elin Thordardottir, Shevell, M., Ménard, S.

Funding: FCAR

...In Press

Title: *Neurological and magnetic resonance imaging findings in children with developmental language impairment*

Description: In this small study nine school age children with well-defined and delineated developmental language impairment (DLI) were compared to twelve control children matched for age, gender and handedness. Detailed neurological and magnetic resonance imaging studies were conducted on both groups in a blinded prospective fashion. Children with DLI were more likely to have subtle neurological findings, which were confirmed on the M-ABC a stan-

standardized measure of fine motor function. These observations confirm previous studies by this group that has documented motoric impairments at school age in pre-school children with DLI thus suggesting that developmental domains other than language are affected by this disorder and may be overlooked due to the extent of the relative language impairment. On MR study, two of the nine children with DLI were found to have structural lesions that may have been causally related to their DLI in the absence of any focal findings on formal neurologic exam. While this finding is a preliminary one based on a relatively small sample, it suggests that consideration should be given to MR study as part of the initial etiologic work-up of these children.

Journal: Journal of Child Neurology

Investigators: Webster, R.I., Erdos, C., Evans, K., Majnemer, A., Saigal, G., Kehayia, E., Elin Thordardottir, Evans, A. & Shevell, M.I.

Funding: REPAR (Operational), MCH-Research Institute (Post Doctoral Fellowship)

Title: *Specific language impairment in French speaking children: Beyond grammatical morphology.*

Description: This study examined 12 preschool children with SLI who were monolingual speakers of Quebec French and compared them to children with typical language development matched on age as well as on language level (MLU). Analysis of spontaneous language provided evidence of a generalized significant delay in language across domains, with very low levels of errors in grammatical morphology. The study documents an important difference in the manifestation of SLI in French and English in the preschool years as English-speaking children are shown to evidence a high rate of inflectional errors in their spontaneous language. The findings have implications for the underlying cause of language impairment as well as for the assessment of SLI in French speaking children.

Journal: Journal of Speech, Language and Hearing Research.

Investigators: Elin Thordardottir, Namazi, M.

Funding: FCAR.

Contact:

elin.thordardottir@mcgill.ca

ADVANCES IN ASSESSMENT:

Title: *Early lexical and syntactic development in Quebec French and English: Implications for cross-linguistic and bilingual assessment.*

Description: A systematic computerized analysis method for spontaneous language samples commonly used in English was adapted to French. The analysis method employing the SALT computer program (Systematic Analysis of Language Transcripts) was modified significantly to reflect the more highly inflected nature of the French language. Normative data are reported for a cross-sectional sample for young preschool children, including mean length of utterance (MLU) in words and in morphemes, vocabulary size and diversity and accuracy of inflectional morphology. Comparison of French and English speaking children reveals important differences such that French speaking children have higher MLUs and smaller vocabularies than English-speaking peers. The article describes the French coding method in detail which can be done by hand or using the SALT program, and is thus of use to clinicians and researchers.

Reference: Thordardottir, E. (2005). Early lexical and syntactic development in Quebec French and English: Implications for cross-linguistic and bilingual assessment. *International Journal of Language and Communication Disorders*, 40, 243-278.

Funding: FCAR

Title: *Spontaneous language sample measures for French-speaking 5-year-olds.*

Description : The spontaneous language analysis method was used to analyze conversational language samples from 58 monolingual French-speaking children in three age groups: 4 ½, 5 and 5 ½.

Results extend those of Elin Thordardottir (2005), providing normative data for these age groups in MLU in words and morphemes, vocabulary size and diversity and inflectional diversity and accuracy. The typical sequence of acquisition of grammatical inflections is documented cross-sectionally including the relation of productive use to age and MLU.

Reference: Elin Thordardottir, Gagne, A., Levy, J. Kehayia, E., Lessard, N., Sutton, A. & Trudeau, N. (2005). Spontaneous language sample measures for French-speaking 5-year-olds. Presented at the annual ASHA conference, San Diego, November.

Funding: MSSS - Ministère de la santé et des services sociaux

Contact:

elin.thordardottir@mcgill.ca

Title: *Bilingual assessment: Can overall proficiency be estimated from separate assessment of two languages?*

Description: A group of normally developing preschool children acquiring French and English simultaneously was compared to monolingual groups of children of the same age speaking each of the two languages. Results showed that normally developing bilingual preschool children do, as a group, score significantly lower than monolingual counterparts in comprehension as well as production on both vocabulary and grammar measures. The study also raised questions about the use of conceptual vocabulary, which involves a combination of vocabulary in both languages, showing this measure to be more affected than was previously thought by the relative level of exposure bilingual children have had to their two languages.

Reference: Elin Thordardottir, Rothenberg, A., Rivard, M.-E., & Naves, R. (2005). Bilingual assessment: Can overall proficiency be estimated from separate assessment of two languages? *Journal of Multilingual Communicative Disorders*, 4, 1-21.

Funding: FCAR



PROMISING PRACTICES

Language Impairment and Attention Deficit Disorder

Language development disorders often coexist with attention deficit/hyperactivity disorders and oppositional behaviour. This co-morbidity is explained by the proximity of the areas in the brain that are responsible for language, behaviour management and executive functions.

When these disorders are identified through neuropsychological assessment in children in our program, their parents are offered support groups and training. These sessions, based on the cognitive-behavioural therapy approach developed by American psychologist Russel Barkel, are led by a neuropsychologist and a social worker. The goal is to provide parents with tools to become involved with their child and develop a sense of competency in their role as a parent. Follow-up should further improve the parent-child relationship and capitalize on periods of positive interaction within the family.

-Benoît Hammarrenger, Ph.D.

Managing the Waiting List for Language Impairments

The intervention philosophy of the Jewish Rehabilitation Hospital's language impairment program promotes early intervention and accessibility to services. To achieve these objectives, management and the interdisciplinary team have implemented various intervention methods that help reduce the wait time for specialized rehabilitation services. To begin with, intervention priority is given to preschool children for whom intervention stops once these children start school. Complementarity of services developed with the school board allows for case management within the school setting.

Intervention is provided via blocks of therapy lasting approximately 4 months. During the blocks of therapy, the clinical coordinator meets with parents who have applied for enrollment. At the end of each block, the clinical coordinator presents new clients to the interdisciplinary team. Intervention schedules and methods (one-on-one, diads, small groups) are reviewed at the time of each block to respond as adequately as possible to each child's needs and allow for case management of those on the waiting list. Furthermore, in summer, large group intervention is available and aimed at preparing 5-year-old children for entry into school.

-Suzanne Ménard, MSc-SLP

BOOKS ON SLI?

At our headquarters at the Montreal Children's Hospital we have a multitude of books on SLI. To borrow any of the following books at no charge, contact: child_disability_link@yahoo.com

1. Communicative Competence for Individuals who use AAC: From Research to Effective Practice. 2003
2. Communicative Development Inventories: User's Guide and Technical Manual. 1992.
3. Communication and Symbolic Behavior Scales, Developmental Profile-1st Normed Edition. 2002.
4. Exemplary Practices for Beginning Communicators: Implications for AAC. 2002.
5. One Child Two Languages: A Guide for Preschool Educators of Children Learning English as a Second Language. 1997.
6. Promoting Learning Through Active Interaction: A Guide to Early Communication with Young Children Who have Multiple Disabilities. 2002.

HELPFUL LINKS

1. <http://www.asha.org>
2. <http://www.cllrnet.com>

