



LanguageLinks[®] to Literacy

IMPLEMENTATION GUIDE



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LanguageLinks® to Literacy Implementation Guide

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About the Authors

Laureate Learning Systems has been dedicated to publishing innovative software designed to improve the lives of children and adults with special needs since 1982. Laureate's research-based programs combine the latest linguistic theory and language research with years of clinical experience, superior instructional design, digital speech, engaging graphics, and amusing animation. Over the years, Laureate's software programs have received national recognition and many awards, including those from the Council for Exceptional Children and Johns Hopkins National Search.

Laureate's team of professionals is led by the company's founders, Dr. Mary Sweig Wilson and Mr. Bernard J. Fox. These pioneering speech-language pathologists were among the first to recognize the important contributions computer technology could make to the lives of individuals with special needs.



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Implementation Guide

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Implementing LanguageLinks® to Literacy

While educators recognize that students must have knowledge of sounds, letters, and the meaning of words to become competent readers and writers, the development of reading and writing competence also requires knowledge of syntax, the way a language assembles words and forms into sentences. Even when vocabulary is controlled, preschool syntactic knowledge predicts first and third grade reading outcomes (e.g., NICHD ECCRN, 2005). Research in the areas of linguistics, language acquisition, and language disorders highlights the importance of syntactic competence. Yet mastery of syntactic forms, as manifested in proficient sentence comprehension and production, is especially problematic for children with language delays and impairments as well as for those who are linguistically and culturally diverse. This impedes the development of both oral and written communication competence (Catts, 1993, 2009; Catts, Adolf, & Weismer, 2006; Catts, Fey, Tomblin, & Zhang, 2002; Dockrell & Connelly, 2015; Kamhi, 2005, 2009, 2014; Petersen & Spencer, 2014).

LanguageLinks® to Literacy focuses on the importance of oral sentence understanding and use as foundational to reading and writing achievement (Hadley, 2014; Kamhi, 2014). In her article, *A Case for the Sentence in Reading Comprehension*, Scott (2009) emphasized the importance of oral sentence understanding for reading comprehension:

“If a reader cannot derive meaning from individual sentences that make up a text, that is going to be a major obstacle in text-level comprehension” (p. 184).

To successfully function in the 21st century, students must have the language skills that enable them to communicate and write effectively. Language is the *core ability* students need for success in school; understanding teachers and peers, following directions, participating in conversation, telling stories involving narrative abilities, learning to read, and learning to do math all rest on linguistic skill (Golinkoff et.al., 2010). In addition to its emphasis on oral sentence understanding and use, *LanguageLinks® to Literacy* introduces students to written sentences and their all important non-content words.

The LanguageLinks® to Literacy Components

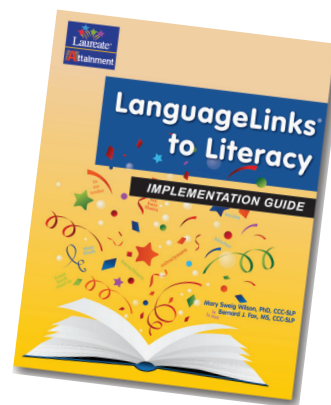
LanguageLinks® to Literacy provides the receptive and expressive syntax intervention students need to become competent oral and written communicators. Teaching focuses on the syntactic forms necessary for sentence understanding and use. As students work through the receptive software delivered modules and the expressive instructor-delivered lessons, they learn critical language skills that are foundational to reading comprehension.

All the components you need to implement the *LanguageLinks® to Literacy* curriculum come in a convenient storage box.

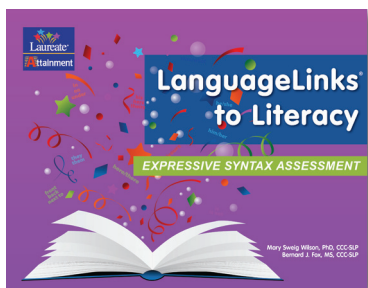
LanguageLinks® to Literacy consists of the following components:

This *Implementation Guide* provides detailed instructions on curriculum administration as well as the research bases and studies showing the effectiveness of the strategies used to teach sentence comprehension and use.

Progress Monitoring Forms for each of the 40 instructor-delivered expressive lessons are provided in this guide. A Mac/Win CD is included which has PDFs of the scoring forms for the assessment, the 40 expressive lessons, and the lesson progress monitoring forms.



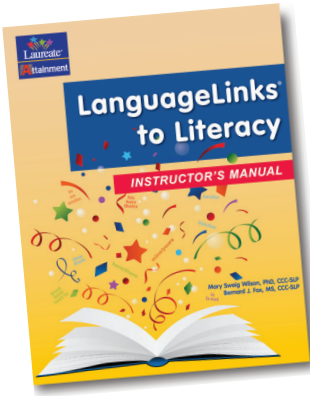
An *Expressive Syntax Assessment (ESA)* tests 35 syntactic forms necessary for sentence understanding and use. Each form is tested using one Imitation item and three Spontaneous ones. Since the ESA uses different illustrations than those used in the software and lessons, post-testing after a student has completed the receptive software modules and expressive lessons provides documentation of generalization. Accompanying the ESA are two pads of scoring forms. The pad with the double-sided page contains the forms used while administering the ESA. The form for Units 1 and 2 is on one side and the form for Units 3 and 4 is on the other side. A single-sided *Scoring and Analysis Summary* sheet is used for documenting pre- and post-intervention ESA performance.



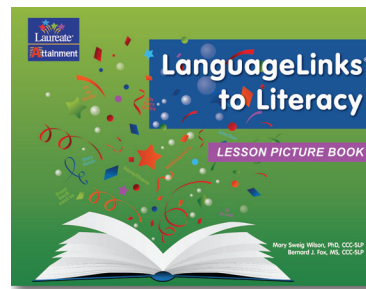
The *LanguageLinks® to Literacy Software* consists of 40 computer-delivered modules that provide receptive assessment and intervention for the syntactic forms. Instruction is delivered via an *Optimized Intervention®* expert system which provides pre-testing, enters students into training at the appropriate level if they don't pass the pre-test, and automatically adjusts instructional support based on students' responses. Training continues until all forms in a module are mastered. Built-in reports document progress through the curriculum.



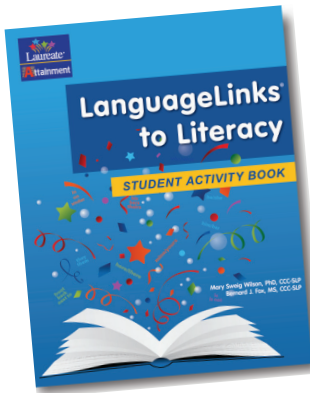
The *Instructor's Manual* includes 40 lesson plans/scripts for either individual or group expressive instruction. Each consists of a first section used to introduce students to the syntactic forms taught in the lesson and a second that demonstrates lesson sentence instruction. In both sections, students imitate and then spontaneously produce the targeted introductory and sample lesson sentences. *Progress Monitoring Forms* are used to document lesson performance.



The *Lesson Picture Book* has all the illustrations used to deliver the 40 expressive lessons in the *Instructor's Manual*. One picture page for each of the 40 lessons is used to introduce the syntactic forms. Additional pages present the 10 contrasting form sets in the lesson. These lesson targets are paired with written sentences.



The *Student Activity Book* has worksheets for use with a teacher or parent.



Activities include identifying the various syntactic forms, using the forms in sentences, matching written forms to their proper illustrations, and writing opportunities. Current thinking is that writing is important to the development of both oral and written competence. Indeed writing words even before students are able to read them is an activity to be encouraged (Herron, 2008).

Who Can Benefit from Using LanguageLinks® to Literacy?

There are a number of populations who can benefit from the language intervention provided by the *LanguageLinks® to Literacy* curriculum. These include:

- Preschoolers on IEPs
- Head Start students
- Preschool through 4th grade students who are English language learners (ELLs)
- Kindergarten students who need Tier 2 intervention in a Response to Intervention (RTI) model to improve language and reading performance

- Young kindergarten through 4th grade students on IEPs who are still experiencing significant language delays
- Fifth through 12th grade students with significant language problems that may be associated with intellectual disabilities and/or autism spectrum disorders (ASD)

The LanguageLinks® to Literacy Curriculum

LanguageLinks® to Literacy is a complete curricular package for developing students' ability to comprehend and produce the syntactic forms that are necessary for oral and written sentence competence. The 40 *LanguageLinks® to Literacy Software Modules* provide independent receptive instruction. The *Instructor's Manual* has 40 parallel instructor-administered lessons for expressive intervention. Both the software comprehension modules and the expressive lessons employ the proven instructional principles of discrete trial training based on the long history of behavior analysis. All instructional components of the package provide written as well as oral sentence examples.

The curriculum focuses on the teaching of what linguists call *functional category* forms. Educators may be more familiar with the term *non-content words* but this classification is less precise than the linguistic definition of functional forms. In current linguistic theory the lexicon or mental dictionary has two divisions, the *lexical* and *functional categories*. The lexical category includes what have been called *content words* (e.g., nouns, verbs, and adjectives). These lexical category members constitute an *open class* in the sense that new words are frequently added (Baker, 2003). In contrast, the functional category is a *closed class* of words and forms that serve essentially grammatical functions. It includes pronouns, verb tense, prepositions, and *wh*-question words. You cannot build sentences without these functional category forms because they impact meaning. Consider the difference in meaning between the following sentence pairs:

1. **He** is running. **She** is running. (pronoun)
2. The boy **is** happy. The boy **is not** happy. (negation associated with verb tense)
3. The ball **is in** the box. The ball **is on** the box. (preposition)
4. **Who** is the man carrying? **What** is the man carrying? (*wh*-question word)

Note that only the functional category forms differ between the sentence pairs yet they completely change the meaning of them. The first pair differs in the pronouns used to discriminate between a single male or female (*he/she* are both marked for number and gender). The second sentence pair uses the contrast between *is/is not* which distinguishes between copular *is* and one marked for negation, *is not*. The third pair contrasts the difference in meaning between *in/on*. The final *who/what* contrast marks the difference between person and object. Clearly the functional category forms change the meaning of these sentences. Without knowledge of the closed class of words that form a hierarchical structure for the nouns, verbs, and adjectives that surround them, students will be unable to comprehend the meaning of sentences either orally or in writing.

Following are the syntactic forms taught in *LanguageLinks® to Literacy*:

Unit 1 Syntactic Forms

1. Is/Are Verb + -ing
2. Is/Are
3. He/She/They
4. Possessive 's
5. Is/Is Not
6. In/On/Under
7. Here/There
8. This/That
9. Me/You
10. Him/Her/Them

Unit 3 Syntactic Forms

21. Do(es) Have/Not Have
22. Why Cause
23. Herself/Other Forms
24. Why Purpose
25. Noun-Verb Agreement
26. How Instrument
27. Will Verb/Is Verb + -ing/Verb + -ed
28. How Manner
29. Himself/Other Forms
30. How/Why

Unit 2 Syntactic Forms

11. Who/What Subject
12. His/Her/Their
13. I/You
14. Has/Have
15. Mine/Yours
16. Who/What Object
17. Who/What/Where
18. My/Your
19. In Front Of/Next To/In Back Of
20. His/Hers/Theirs

Unit 4 Syntactic Forms

31. Themselves/Other Forms
32. How/Why/Where
33. We/You
34. These/Those
35. Our/Your
36. Above/Below
37. Us/You
38. Ours/Yours
39. In Front Of/Between/Behind
40. Is Verb + -ed By

Next is a description of protocols designed to ease navigation through the curriculum.

Some Protocols Followed in the *LanguageLinks® to Literacy* Components

To facilitate easy administration of the various components of the package, a number of protocols have been established. First, to accommodate a variety of students and schedules, the curriculum has been divided into four units of testing and instruction. The following Unit colors are used throughout:

Unit 1

Unit 2

Unit 3

Unit 4

Each unit in the *LanguageLinks® to Literacy Software*, as well as the expressive lessons in the *Instructor's Manual*, contains 10 modules or 10 lessons. Although divided into four

units, modules and lessons are numbered consecutively from 1-40. We have maintained the unit division in the *Expressive Syntax Assessment* (ESA) although we only test a representative sample of 35 syntactic forms from the more than 80 that are taught.

In the ESA and the expressive lessons in the *Instructor's Manual* we have used an additional color protocol:

- Instructions appear in black.
- What an instructor says appears in blue with targeted syntactic forms in either *blue italics* or *blue bold italics*.
- Student responses appear in red with the targeted syntactic forms in *underlined red bold italics*.

Next, consider what you need to launch the curriculum with your students.

Getting Started with LanguageLinks® to Literacy

The *LanguageLinks® to Literacy* curriculum was designed to follow a progression from expressive assessment, to oral comprehension teaching, to expressive language teaching, to supplementary student activities, and finally expressive post-testing following completion of the receptive computer-administered modules and the expressive instructor-administered lessons.

To administer the curriculum:

1. Give the *Expressive Syntax Assessment* (ESA) using the ESA scoring forms. Start with the 10 syntactic forms tested in Unit 1. Stop testing at the end of the unit where a student fails to correctly produce all the spontaneous elicitations for the syntactic forms tested in that unit.
2. Enter students into the computer-administered *Software Modules* for the unit in which they failed to spontaneously produce all three elicitations for one or more forms. Administer all the modules in the unit, not just the ones failed. The software is designed such that students will not enter into training if they pass the pre-test for the forms in a module.
3. The expressive lessons in the *Instructor's Manual* can be administered after students have either passed the pre-test for a software module or exited training thus demonstrating receptive mastery over the taught syntactic forms. You can also choose to have students complete all the software modules in a unit before starting the expressive lessons. Students who move quickly through the curriculum are those for whom you might want to use the latter approach, while for struggling students, doing an expressive lesson immediately following demonstration of receptive competence should be considered. You know your students best so the decision is yours.

4. While delivering the expressive lessons, use the *Progress Monitoring Forms* in the *Implementation Guide* (also available on the CD with PDFs) to record lesson responses. Each form has room for three students. If you are working with a struggling student individually, you can use the same form for up to three repetitions of the lesson. Similarly, you can use more than one form if you have more than three students in a group.
5. The *Student Activity Book* worksheets can be used to supplement the expressive lessons. Each form in a lesson has a student activity page devoted to it. An additional page provides activities involving all the forms in the lesson.
6. Once students complete all the expressive lessons in a unit, post-test them using the ESA.

The details for using each of the components of *LanguageLinks® to Literacy* are presented below.

Expressive Syntax Assessment (ESA)

The first step in administering the *LanguageLinks® to Literacy* curriculum is pre-testing students' competence in using a representative sample of the syntactic forms taught. Each of the curricular components is organized into four units with syntactic forms numbered consecutively through the units thus enabling instructors to easily locate content both by unit and by form number. The ESA expressively tests 35 syntactic forms taught in the 40 modules/lessons. Unit 1 tests ten forms, Unit 2 tests nine forms, and Units 3 and 4 test eight each. The forms were chosen to properly represent the scope of the curriculum. When there was a choice of forms within a module/lesson to test, we chose the one that research and clinical experience had shown to be most difficult. Finally, we made sure that the range of syntactic forms tested represented the entirety of those taught.

Each syntactic form in the ESA is tested using one imitation response and three spontaneous ones. A syntactic form is considered mastered if a student is able to correctly produce all three spontaneous responses. This testing procedure has demonstrated effectiveness in evaluating students' syntactic competence (Wilson, 1981, 2000; Wilson & Charron, 1978; Wilson & Pascoe, 1999). By targeting the elicitation of syntactic forms critical to sentence understanding and use, the assessment assures that a student is indeed capable of producing them.

Two forms are provided to record responses during testing. The *Units 1 & 2 Scoring Form* and the *Units 3 & 4 Scoring Form* list both Imitation and Spontaneous responses for all 35 syntactic forms tested. After testing, the examiner calculates and records the Imitation, Spontaneous, and Mastery Scores (3/3 Spontaneous responses) on the appropriate form. The Imitation, Spontaneous, and Mastery Scores are then transferred to the *ESA Scoring &*

Analysis Summary sheet for pre- and post-module/lesson intervention documentation. The *Scoring* and *Summary* forms are available in the two pads included in the box.

All syntactic forms in a unit should be tested. If a student fails to master any of the forms in a unit, testing should stop and the student should begin using the software modules in that unit.

LanguageLinks® to Literacy Software

Students who fail to master all syntactic forms in any unit should be entered into the first software module in that unit even if they have passed most of the forms in the unit on the ESA. The software uses an *Optimized Intervention*® expert system¹ that only enters students into training if they fail to demonstrate receptive mastery of the syntactic forms in a module during pre-testing (80% correct on all the module's forms). With the built-in reports provided, an instructor has documentation that in fact a student demonstrated comprehension of the syntactic forms in a module and hence did not need to enter training.

A further advantage of *Optimized Intervention*® is that once students enter into training for any module for which they did not demonstrate mastery in the pre-test, the system automatically adjusts instructional support based on student responses. Students demonstrate comprehension of all the forms taught in a module by successfully completing an entire set of 10 forms each, two times with at least 80% accuracy and no antecedent events (e.g., no instruction or cuing prior to a trial).

Once a student has mastered a module whether thorough pre-testing or in training, s/he is ready to move on to the next module in the developmentally ordered sequence. Instructors should go to the Module Tab in the software and choose the next module in the sequence. Instructors can choose to review a module after it has been mastered, but no data will be collected and all instruction will be at the highest level.

The built-in reports provide documentation of students' mastery over the various syntactic forms taught in the *Software Modules*.

Instructor's Manual

The software ensures that students comprehend the syntactic forms. The expressive lessons in the *Instructor's Manual* teach them to use the forms in sentences within a structured context. Without explicit receptive and expressive instruction, many students fail in their ability to comprehend and produce sentences in communication contexts.

The 40 scripted expressive lessons in the *Instructor's Manual* provide students with the explicit structured intervention they need to master production of the functional category

¹ This expert system was developed with the assistance of a Technology Transfer from NASA's Johnson Space Center and a series of Small Business Innovation Research (SBIR) grants from the National Institutes of Health (NIH).

forms in sentences so they can use these sentence structures in both spoken and written communication contexts.

At the beginning of each lesson, the materials needed and the goals to be achieved are given. All the pictures needed for lesson administration can be found in the *Lesson Picture Book*. *Progress Monitoring Forms* are provided in Appendix B of the *Implementation Guide*. A PDF of this appendix can be found on the Mac/Win CD as well.

Lesson Picture Book

The *Lesson Picture Book* contains all the pictures needed to deliver the expressive lessons. The first page for the lesson contains the pictures used to introduce students to the syntactic forms. This introductory picture page is followed by all the pictures and accompanying text for all the lesson sentences. A PDF of the *Lesson Picture Book* can be found on the Mac/Win CD. The PDF can be used with a smart board to deliver group instruction.

Student Activity Book

The *Student Activity Book* contains worksheets to provide both oral and written practice using the forms. These activities are designed to be used with a teacher, a teacher's assistant, or a parent/caregiver. Each of the 40 lessons in the *Instructor's Manual* has one activity page devoted to each of the syntactic forms taught and an additional page that mixes all the forms. A variety of activities offers opportunities for students to increase their competence in using the sentence forms taught.

Implementation Guide

The *Implementation Guide* explains the theory and research bases of *LanguageLinks® to Literacy*. We also provide guidance in using the various components in the package. Appendix A in this guide contains copies of the *ESA Units 1 & 2 Scoring Form*, *Units 3 & 4 Scoring Form*, and the *Scoring & Analysis Summary* documents. Appendix B has the *Progress Monitoring Forms* for all 40 expressive lessons in the *Instructor's Manual*.

Theory & Research Bases

The uniformity and rapidity of first language acquisition is possible because human infants are born with a biologically endowed innate language faculty within the brain that drives the course of language development. Our human language faculty orchestrates and shapes the acquisition of language. While neurotypically developing children need only the surrounding language input to acquire language, children with language delays and disorders need more than exposure to develop communication and reading competence. Included in *LanguageLinks® to Literacy* are research-based assessment and intervention materials. These instructional components are designed to teach the syntax and semantics of simple sentences, prepositions, questions, and narrative perspective taking.

Neurotypically developing language learners are remarkably capable of exploiting language clues in their receptive language environment, and with little apparent effort are able to integrate this information into an ever-growing and increasingly nuanced framework of syntactic, semantic, and conceptual information (e.g., Booth, Waxman, & Huang, 2005; Gleitman, Cassidy, Nappa, et al., 2005; Hall & Waxman, 2004; Johnson & de Villiers, 2009; McDonald, 1997). This is even more remarkable considering that the process is based largely on information received through *incidental* exposure to language. Language acquisition also proceeds at an extraordinary pace, with most children already demonstrating knowledge of fundamental grammatical features as they begin combining words at 18 to 24 months of age and then going on to acquire fundamental syntactic competence by the age of six (e.g., Bohnacker, 1997; Brown, 1973; Engle, 1978; Fenson, Dale, Reznick, et al., 1994). Children with *language disorders*, however, clearly have an impaired ability to acquire the formal components of language (i.e., vocabulary and syntax) based solely on the input they receive from their receptive language environment. Clinical data show that, despite extensive incidental exposure to language, the majority of these children have a markedly limited vocabulary and poor command of syntax, and clearly need systematic language instruction.

Significant delays in the acquisition of language are *the* most prevalent developmental disorders seen in children. One rigorous epidemiological study involving more than 7,000 subjects estimated the overall prevalence of specific language impairment (i.e., a language disorder that cannot be attributed to other conditions such as hearing loss or other developmental disability) among 5-6 year old kindergartners at 7.4 percent (Tomblin, Records, Buckwalter, et al., 1997). This estimate is consistent with other work indicating that specific language impairment affects between 6% and 8% of preschoolers, and a much higher percentage of children from disadvantaged backgrounds (Boyle, Gillham, & Smith, 1996; Leonard, 1998; Paul, 1996; Rescorla, Roberts, & Dahlsgaard, 1997). These

estimates do not include the prevalence of children with language impairments that co-occur with other developmental disabilities.

Research has found that verbal children with ASD, Down syndrome, and specific language impairment have similar language profiles, which are characterized by delayed lexical and syntactic development (e.g. Geurts & Embrechts, 2008; Luyster et al., 2008; Tager-Flusberg, 2000; see Tager-Flusberg, Paul, & Lord, 2005), suggesting that similar language goals and treatment strategies would be appropriate for them.

Recently there was a discussion regarding reading instruction on the SpellTalk listserve (spelltalk@listserve.com; URL: <http://mailman.listserve.com/listmanager/listinfo/spelltalk>) in which John Alexander, Head of School at the Groves Academy, pointed out,

“If one follows a diagnostic-prescriptive approach, good reading instruction is good reading instruction. We need to manipulate the variable of instruction—intensity, frequency, and duration—depending upon the need of the student” (Alexander, February 8, 2015).

Steve Dykstra, a psychologist and prolific contributor to SpellTalk, replied,

“I agree, but we often get the impression that different people need different things, when in fact, that isn’t it at all...The most gifted and most disabled readers differ only in the difficulty they have in mastering the various parts of reading” (Dykstra, February 8, 2015).

So too with oral language—we all must learn the same vocabulary and syntactic forms regardless of our ease or difficulty in doing so. With oral language as with reading, instructors must provide intervention at the intensity, frequency, and duration an individual student needs.

Preschoolers with *semantic-syntactic* language deficits are at much greater risk for reading disabilities during their school years, *with early syntactic ability seeming to be an especially important variable* (Bishop & Adams, 1990; Catts, 1993; Catts, Adolf, & Weismer, 2006; Scarborough, 2001). A meta-analysis by the National Early Literacy Panel (NELP; 2009) concluded that oral language was particularly related to later literacy achievement when this variable was defined in terms of *grammar* and *receptive language*. A study examining the reading ability of second and fourth graders in a sample of more than 300 children who had been identified in kindergarten as having language impairments (Tomblin, Records, Buckwalter, et al., 1997), found that as a group these children scored significantly below matched controls on word recognition and reading comprehension (Catts, Fey, Tomblin, & Zhang, 2002). In fact, about half of the children met criteria for having a reading disability in second (52.9%) and fourth grade (48.1%). Academic difficulties associated with language delays also tend to persist through the later school years (e.g., Aram & Nation, 1980; Aram,

Ekelman, & Nation, 1984; Dockrell, Lindsay, & Connelly, 2009; Kelso, Fletcher, & Lee, 2007).

Educators and researchers have long recognized that most students with language disorders regardless of etiology *need* systematic training to develop linguistic competence, and this is a *prerequisite* to communicative competence (e.g., Shewan, 1975, p. 311). Despite this long established research-based observation, most formal language intervention programs currently emphasize the use of language for social communication (e.g., McCauley & Fey, 2007) without stressing the importance of establishing a language knowledge base. That is, treatment emphasis is on the communication aspects of language with a focus on using language in social settings. These programs feature goals that involve, for example: a) the use of language facilitation techniques such as open-ended questions, and the expansion of a child's utterances during interactive communication; b) modeling and imitation in a functional language context; and c) conversational recasting using more advanced forms and language functions (Camarata & Nelson, 2007; Cirrin & Gillam, 2008; Cole, Maddox, & Lim, 2007; Hancock, Kaiser, & Delaney, 2002; Pepper & Weitzman, 2004; Ellis Weismer, 2000). This emphasis is valuable given that functional communication is so important to navigating one's environment and basic quality of life. In terms of language development, however, this approach can be enhanced by providing both technology-delivered receptive language intervention designed to support the development of syntax comprehension and discrete trial intervention for building expressive command over the sentence forms necessary to communicate.

The structured receptive and expressive intervention components of *LanguageLinks® to Literacy* provide the language foundation for building communicative competence. The emphasis in *LanguageLinks® to Literacy* is on the formal grammar component of language: the lexicon and syntax. This approach enables speech-language pathologists (SLPs) and special educators to focus on expressive language development in social contexts with the knowledge that their students are also getting the foundational grammar instruction they need.

Linguistic Research Bases for LanguageLinks® to Literacy

Linguistic, language acquisition, and language disorders research highlight the importance of syntactic competence. Yet mastery of syntactic forms as manifested in proficient sentence comprehension and production is especially problematic for students with language disorders (including those with ASD, intellectual disabilities, as well as students who are deaf or hard of hearing), and this obviously impedes the development of both oral and written communicative competence.

A central theme in language acquisition research concerns just how language is learned – what are the cues that neurotypically developing children so efficiently exploit as they rapidly acquire language from their receptive language environment – and what are the best means to facilitate this process in children who are not acquiring language in a typical

manner? Language development in neurotypically developing children is very similar around the world. First words emerge, word combinations occur, and syntax is mastered at about the same ages regardless of language or culture. There are also striking commonalities across all human languages that extend to both language structure and the syntactic operations involved in using language to express human thought. The universal course of language development underscores its biological underpinnings. The accepted biolinguistic view is that the capacity for language is a species-specific endowment, and that language acquisition in human children is supported and guided by an innate language faculty (Berwick & Chomsky, 2011; Hauser, Chomsky, & Fitch, 2002; Laka, 2009). While doubted 50 years ago, the biolinguistic view is now widely accepted. The language faculty orchestrates language acquisition so neurotypically developing children need only *language exposure*, i.e., linguistic input, to acquire language – at least insofar as acquisition of the formal grammar component (i.e., vocabulary and syntax) is concerned.

Noam Chomsky's *Principles and Parameters Theory* (Chomsky, 1981) and its refinement under the *Minimalist Program* (Chomsky, 1995, 2002, 2009) provides a descriptive and explanatory framework for much of current linguistic research. The field of linguistics provides us with the knowledge of what language is and hence what to teach students who are not acquiring it in a typical manner. Current linguistic theory and research has informed the development of *LanguageLinks® to Literacy* insofar as content is concerned.

Within the *Minimalist Program*, the lexicon (the 'dictionary' of words and forms in the language) has taken on a far more important role than in earlier generative grammar proposals. The representation of a word in the lexicon includes not only phonological and semantic properties (i.e., sound and meaning), but also syntactic features such as *categorical membership* (e.g., whether it is a noun or verb), and *inflectional behavior* (i.e., how the word may be marked for number, person, and gender). In other words, a complete lexical or dictionary entry is thought to include the specific roles a word can play in the structure of language and the appropriate form of that word in any given sentence context. These properties of the lexicon are especially relevant here for instructional design.

In current linguistic theory the lexicon is divided into two divisions, the *lexical* and *functional categories*. The lexical category includes the familiar nouns, verbs, and adjectives; an *open class* in the sense that new words are frequently added; e.g., recent nouns (*flash mob*, *bestie*), verbs (*swipe right*, *twittering*), and adjectives (*gypset*, *braggadocious*; see Baker, 2003). In contrast, the functional category is a *closed class* of words and forms that serve essentially grammatical functions. Included in the functional category are:

Determiners – associated with nouns and so-called because they specify (determine) that to which a noun expression refers. *Determiners* include, for example: the articles “*a*” and “*the*”; pronominal determiners (e.g. *this*, *that*, *these*, *those*); pronouns (e.g., *I*, *you*, *me*, *his*, *her*); and anaphors or reflexives (e.g., *myself*, *himself*, *themselves*).

Tense – associated with verbs and includes elements that inflect verbs for tense and agreement. *Tense* includes, for example, the regular past tense “-ed” (*She painted the chairs*), future modal “will” (*He will run*), infinitival “to” (*He likes to run*), copular and auxiliary “be” (*He is big. They are running*), 3rd person singular “-s” (*The boy runs*) and negation (e.g., *is/is not* and *does/does not*).

Prepositions – were traditionally considered to be among the lexical categories. More recently, however, linguists have presented arguments for including prepositions in the functional category (Baker, 2003; Moro, 2008). Like the other members of the group, prepositions are a closed class of words. While languages freely add nouns, verbs, and adjectives to the lexicon, this is not the case with the functional categories.

Complementizers – associated with subordinate clauses and questions. They play a central role in forming questions. This is true for *yes/no*-questions and *wh*-questions which include the question words *who*, *what*, *where*, *how*, and *why*.

The acquisition of functional category forms is essential to the comprehension and production of sentences. Indeed, hierarchical sentence structure emerges as the functional category forms are acquired. Typically, these forms first emerge as children enter the two-word stage of language development (18-24 months; Bohnacker, 1997; Brown, 1973; Engle, 1978; Fenson, et al., 1994). Children at this early stage will, for example, begin to use *possessive 's* (e.g., *Daddy's hat*), and produce forms such as determiner *no* (e.g., **No shoe**). As such, we know that young language learners are processing functional category information to at least some extent starting at a very early age. At this stage children may still produce an expression using bare nouns and verbs such as *Ball roll*, but bare items do not occur in adult English. Instead, an adult would include the determiner *the* and the tense element -s and say, “**The ball rolls**” or “**The ball is rolling.**” In sentences generated by competent language users, nouns combine with determiners to become determiner phrases (e.g., *dog* combines with *a* or *the* to become *a/the dog*). In the case of pronouns, which are determiners, the noun is replaced (e.g., *a/the dog* is replaced by *it*). Similarly, verbs combine with tense elements to become tense phrases. The role of functional category forms is described in the following quote.

“One intuitive way to think about functional categories is that they erect a syntactic skeleton above lexical category forms which serves to hold together the various syntactic relations that take place in the phrase” (Adger, 2003, p. 165).

Unfortunately, functional category forms are especially problematic for children with language disorders. In fact, a clinical marker for children with language impairment is the inaccurate or infrequent use of functional category forms (e.g., Bedore & Leonard, 1998

Leonard, 1998; Rice, 1998; Rice, Wexler, & Hershberger, 1998; Roeper & Seymour, 1994 also Trantham & Pedersen, 1976; Wilson & Pascoe, 1999).

Rice (1998) documented the use of tense forms in 5-year-olds with language impairment and age-matched controls. Only *one* of 37 children with impairments used obligatory tense forms more than 60% of the time, whereas *all but one* of the 45 children in the control group used these forms with 75% or greater accuracy. Given the critical role of functional category forms in language learning and the fact that these are a particular area of weakness in children with language delays and disorders, clearly functional category training ought to be included in language intervention plans. *Importantly, functional category forms are a part of the lexicon. The lexicon is learned and what is learned can be taught. This means we can use instructional strategies to teach functional category forms and their grammatical properties to students with language disorders.*

Students who are struggling with functional category forms will be at a clear disadvantage when attempting to comprehend or produce even simple phrases and sentences, and will certainly be at a loss when striving to comprehend syntactically rich, recursive, hierarchically structured spoken and written language. Moreover, these are precisely the kind of language deficits that research suggests cannot be addressed effectively in social communication contexts (e.g., Law, Garrett & Nye, 2004), and are associated with later academic disabilities (e.g., NELP, 2009). What seems clear is that functional category forms and their associated structures should be a focus of intervention. With proven instructional strategies we can teach the understanding and use of functional category forms to students with language delays. This will help them master syntax and become more successful students regardless of ability level.

Building language intervention curriculums whose content derives from current linguistic theory and research has been an ongoing focus of Laureate's development efforts since its founding in 1982. A fundamental assumption guiding these efforts and supported by an extensive body of literature is that children with language impairment must not only receive intervention that teaches the understanding of vocabulary and syntax, they will also need structured expressive instruction to teach the use of words and forms in sentences.

Instructional Research Bases for LanguageLinks® to Literacy

The manner in which curricular content is delivered ought to be driven by what has been learned from research examining the effectiveness of specific instructional methods. The well-established learning principles of *behavioral analysis* and *errorless learning* (Holland & Skinner, 1961; Terrace, 1963) are the foundation for instructional delivery design in *LanguageLinks® to Literacy* which provides *receptive language instruction* through a computer-delivered software component and *expressive language instruction* through instructor-delivered lessons. The curriculum is taught using *discrete* or *explicit trial instruction*. Research, including our own, has shown that explicit trial instruction, featuring