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# Beyond the red pen: A functional grammar approach to evaluating the written language of deaf students

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#### **Abstract**

Deaf students often differ from their hearing peers in written language development. Providing developmentally appropriate instruction is ideal, yet current methods of writing assessment do not provide teachers with sufficient information regarding the written language (i.e., syntactic) development of deaf students. In this research, we use a Systemic Functional Grammar (SFG) approach to language analysis to provide teachers with a new way to evaluate deaf students' writing. This project consisted of two studies. The first study focused on determining whether SFG analysis could be helpful for teachers of the deaf. The second study focused on mapping a trajectory of the written language development of deaf students and the development of written language inventory for teachers of the deaf. This inventory, along with additional evaluation tools, has the potential to impact both objective setting and instruction.

#### KEYWORDS

assessment, deaf education, language

#### 1 | INTRODUCTION

Written language development is a complex process, that begins, for most children, with spoken language development. Children with normal hearing acquire spoken language skills naturally through authentic communication in their environment. However, deaf children, have limited access to spoken language. Factors such as age of hearing loss identification, age of intervention, use of hearing technologies, and chosen mode of communication all impact access to and development of language for deaf students (Antia, Ree, & Kreimeyer, 2005). While sign language does allow deaf children uninhibited access to language through a visual pathway, sign

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language is only used in the home of 22.9% of the deaf students in the United States (Gallaudet Research Institute, 2013) and less than 5% of deaf children are born to deaf parents (Mitchell & Karchmer, 2004). Unlike hearing children, the vast majority of deaf children do not have full access to language models from birth.

It is not surprising that research has found that language deficits can exist for deaf children regardless of the chosen language of communication, including American Sign Language (ASL; Schick & Hoffmeister, 2001; Strong & Prinz, 1997), English-based sign language (Geers, Moog, & Schick, 1984; Schick & Moeller, 1992), and spoken English (de Villiers & de Villiers, 2003; Geers et al., 1984). As Easterbrooks and Baker (2002) wrote, the most challenging aspect is not one's hearing level but rather the language development delays and deprivation due to insufficient visual input and/or inaccessible auditory input. Expressive and receptive language delays have major implications for school learning (Hartmann, 1996), which occurs "through the medium of language" (p. 34; Bransford, Darling-Hammond, & LePage, 2005).

Since early language access and development are essential to later literacy development (Cunningham & Stanovich, 1997; Hart & Risley, 1995, 2003; Tabors, Snow, & Dickinson, 2001), reading and writing can be a struggle for those deaf students who have delayed access to language (Schirmir, 2000). The reading challenges of these deaf students have been well documented (Allen, 1986; Dew, 1999; Traxler, 2000). There is evidence that deaf students who do not have early access to language continue to graduate with reading levels below those of their hearing peers (Commission on Education of the Deaf, 1988; Johnson, Liddell, & Erting, 1989; National Agenda, 2005; Paul & Quigley, 1990;). Notable delays and differences in the written language development of these deaf students have also been well documented (Ivimey & Lachterman, 1980; Kretschmer & Kretschmer, 1986; Moores & Sweet, 1990; Yoshinaga-Itano, Snyder, & Mayberry, 1996).

Studies have found differences in the rates of syntactic development between hearing and deaf students (Antia et al., 2005; Musselman & Szanto, 1998; Yoshinaga-Itano & Snyder, 1985). The prevailing focus of research in this area has been on examining syntactic development at the sentence level and not in the broader context of authentic writing. In addition, much of the research has focused on identifying differences and comparing deaf student's syntactic maturity to hearing student's syntactic maturity. For example, Yoshinaga-Itano and Snyder (1985) found that deaf students, both those who used listening and spoken language and those who used signed language, scored considerably below the average range in syntactic maturity on the *Test of Written Language*.

While Yoshinaga-Itano and Snyder (1985) did compare the written language patterns of performance of deaf children who only use spoken language with those who use signed language, they do not report on the sign language development or proficiency of the students. Other researchers have examined the relationship between sign language proficiency and syntax. For example, Koutsoubou (2010) studied the writing of one deaf student, who was assessed by his teachers to be a "very good user" of both Greek Sign Language and written Greek. He found that the student included 100% of the basic and essential information in his narrative; however, his narrative contained little structural variety and complexity. The student primarily used simple sentences to sequence events, while using very few clauses to tell why or how or to evaluate.

Van Beijsterveldt and Van Hell (2009a) compared narratives written in Dutch by deaf children who were proficient in Sign Language of the Netherlands (SLN) and deaf children who were low-proficient in SLN, as well as, hearing monolingual and bilingual children. They found that narratives of proficiently signing deaf children contained more evaluatives than narratives of low-proficiently signing deaf children, and hearing bilingual and monolingual children. In a second study, however, they found that proficiently signing deaf children more often omitted obligate articles than low-proficiently signing students (Van Beijsterveldt & Van Hell, 2009b). They concluded that sign language proficiency seems to affect, in particular, aspects that differ substantially across sign language and oral language. Identifying these qualitative and quantitative differences in the syntactic development of deaf students compared to the syntactic development of hearing students has provided teachers with very little direction when it comes to planning instruction.

Developmentally appropriate instruction must be informed by assessment (Bredekamp, 1987; Coffin, 2010; de Oliveira & Schleppegrell, 2015; Vygotsky, 1978), yet current assessments provide

insufficient information for guiding the construction of written language objectives (French, 1999; Mayer, 2010; Musselman & Szanto, 1998). Language is made up of five main components: phonology, morphology, syntax, pragmatics, and semantics. Assessments of written language can measure any one, or all, of these components as well as various constructs of writing (e.g., ideas, cohesion, organization). There are both formal and informal options for written language assessment. The primary disadvantage of formal assessments is that they tend to measure comprehension and use of language that is decontextualized or contrived. In addition, they provide quantitative information comparing a student's performance to a specific criterion or to the performance same-age or same-grade peers. This type of information is valuable for some purposes, but it does not help a teacher plan instruction. On the other hand, informal written language assessments are able to measure comprehension and use of language in context and provide a more direct link between assessment and instruction. Informal measures of written language include the cloze procedure (see Moores, 1970), Curriculum Based Measures (see Rose, McAnally, & Quigley, 2004), skills checklists, and rubrics. Still none of these assessments provide teachers with meaningful information about the language resources students are using in their writing. Teachers of the deaf need to know more about the syntactic development of deaf students. They need both an understanding of how deaf students in general progress in acquisition of syntactic structures and also a way to determine where their students are in that progression.

Literacy development inventories (see, e.g., *Qualitative Reading* Inventory [6th edition, Leslie & Caldwell, 2017], *Bader Reading and Language Inventory* [7th edition, Bader & Pearce, 2013], and the spelling inventories found in *Words Their Way: Word Study for Phonics, Vocabulary, and Spelling Instruction* [6th edition, Bear, Invernizzi, Templeton, & Johnston, 2016]) provide teachers with a way to take inventory of the skills their students have mastered, as well as a way to use "miscue analysis" (Goodman, 1969) to inform their understanding of the ways in which students are approaching literacy processes (i.e., decoding and encoding). The purpose of this research was to develop a written language inventory that could provide vital information to teachers who are providing writing instruction to deaf students. This inventory can provide teachers with a way to identify the linguistic structures students are using, not yet using, or confusing. Further analysis of the structures they are using in partially correct or confused ways can provide insight into the process through which a student is constructing meaning and can illuminate areas of need for targeted instruction. In this way, the inventory will be able to guide written language instruction, allowing it to be more developmentally appropriate (Bredekamp, 1987).

We do acknowledge that a pitfall of developmental inventories is that they may seem to imply that all children develop in the same way at the same time. The purpose of this study and the resulting inventory is not to make such a claim. The inventory was developed and should be used with developmental variation in mind. No two children are exactly alike, yet without knowledge of typical milestones and general trajectories it would be difficult for parents or teachers to facilitate development in any area. The purpose of this study is to extend our knowledge of deaf students' syntactic development and to develop a flexible tool that can help teachers and other professionals facilitate that development.

#### 2 | SYSTEMIC FUNCTIONAL GRAMMAR

Systemic Functional Grammar (SFG) provides a way to consider how language works in context, as well as what language options are available (Fontaine, 2013; Halliday & Matthiessen, 2014). In this study, SFG acts as both the theoretical framework and the method of analysis. It was chosen as a framework to guide the development of the written language inventory because it allowed us to ensure that the inventory focuses on both form and function. When teachers use an SFG approach, evaluation and feedback are focused (first) on function, or meaning. Because meaning and form are connected, students will learn form implicitly. The goal of an SFG perspective is

not to fix the errors in student writing, but to expand the options students have for making meaning (de Oliveira & Schleppegrell, 2015). It is assumed that errors are a natural part of language learning. In other words, before a student masters a particular linguistic structure, they will first make attempts in which they use the structure with confusion (i.e., error).

An SFG approach allows teachers to focus on teaching students how to use the meaning-making resources they have and on teaching them about the choices available to them (de Oliveira & Schleppegrell, 2015). While it has not been used as an approach to language instruction in deaf education, it has been used and studied in both first and second language learning in schools. Research has found that using the meta-language of SFG in instruction has led to improved outcomes in both reading (e.g., Bailey & Heritage, 2008; de Oliveira & Dodds, 2010; Schleppegrell, 2013) and writing (e.g., Aguirre-Muñoz, Park, Amabisca, & Boscardin, 2008; de Oliveira & Lan, 2014). Since SFG can be used as an instructional tool to positively impact literacy outcomes, we hypothesized that it could also be used as an assessment tool to inform instruction.

Words occur in patterns, groups, phrases, and clauses. An SFG analysis accounts for these patterns and captures how linguistic structures are used to construct meaning. SFG analyzes a clause, but instead of traditional labels, such as subject and predicate, it uses functional labels. These labels differ according to the metafunction that is being analyzed. SFG names three metafunctions of language: *textual*, *interpersonal*, and *experiential* (Halliday & Matthiessen, 2014). Each metafunction has its own system of choices (Thompson, 2014). In this study, we use an experiential analysis. The experiential metafunction has to do with the representation of the writer's experiences in the external world (i.e., entities, events, qualities) and internal world (i.e., thoughts, beliefs, feelings).

In an experiential analysis, a clause is a representation of a particular situation involving *participants* and *processes* against a backdrop of *circumstances* (Fontaine, 2013). *Participants*, the persons or things involved, are realized by nominal groups. *Processes*, the ways of happening, doing, sensing, saying, being, or having, are realized by verbal groups. *Circumstances*, the manner, location, and time in which processes occur, are realized by adverbial groups and prepositional phrases. Together participants, processes, and circumstances are used to represent entities in the world and the ways in which those entities act on or relate to each other (Fontaine, 2013). Both participants and processes are inherent or obligatory components of a clause. On the other hand, circumstances are almost always optional augmentation. An experiential analysis can be used to identify the resources students are using to represent their ideas.

Figure 1 is an example of an experiential analysis of the sentence "The last unicorn lived in a lilac wood, and she lived all alone," a quote from Beagle's (1968) *The Last Unicorn*. In this analysis, the language used to organize an imaginary happening is labeled and the labels provide information about how the author used specific linguistic structures to construct a text that declares to the reader who ("the last unicorn") did what ("lived"), where ("in a lilac wood"), and how ("all alone").

"The last unicorn lived in a lilac wood, and she lived all alone." (Beagle, 1968)												
The	ne last unicorn lived in a lilac wood, and she lived all alone.										alone.	
	Partic	ipant	Process		Cir	cumsta	ance		Participant	Process	Circu	umstance
article + te adjective + noun ac			past tense action verb	pre	epo	where sitional	? l phrase		3rd person subject pronoun	past tense action verb	ļ	now?

FIGURE 1 Experiential analysis example

#### 3 | STUDY 1

#### 3.1 | Background

This research developed out of a larger three-year federally funded research project to more fully develop Strategic and Interactive Writing Instruction (SIWI; Wolbers et al., 2018), an approach to writing instruction designed for use with deaf students. One of the primary responsibilities of the teacher participants (*N* = 6) in the study was setting discourse-level objectives (e.g., genre traits and organization) and language-level objectives (e.g., grammar/syntax) for their students. We found teachers struggled most with setting appropriate language-level objectives. They tended to choose skills that were easy to identify with a first glance, such as verb tense, capitalization, and punctuation. The skills they chose were things they were able to easily measure and address through mini-lessons; however, they were rarely aimed at helping students understand how words function together in groups and phrases. In our weekly meetings with teachers, they reported that it was difficult to set objectives because their students' writing contained so many errors and that they were not sure of the best way to determine if an objective was appropriate for a student's current level of development. This dilemma led the research team to wonder if a functional approach to writing analysis could be helpful for teachers.

In Summer 2013, we asked the participating teachers to engage in SFG experiential analysis of a few writing samples, labeling the participants (i.e., nouns and noun phrases), processes (i.e., verbs and verb phrases), and circumstances (i.e., adverbs and adverbial phrases). Together, the teachers and members of the research team, discussed how the analysis informed our knowledge of the students' language development. During this discussion, we noted that the analysis allowed us to pick up on characteristics of the students' language development that we had not noticed previously. In fact, it allowed us to shift our focus from identifying errors to identifying structures that students were using.

#### 3.2 | Experiential analysis

The purpose of the first study was to determine if SFG experiential analysis could be used to identify a general trajectory of deaf student written language development and to determine if this information and type of analysis could impact the language assessment and instruction of deaf students. At the beginning of the 2013–2014 school year, we collected both recount and information report writing samples from 26 deaf students, resulting in a total of 52 samples from deaf students. These students were divided into low (N = 9), middle (N = 11), and high (N = 6) groups based on language proficiency levels reported by their teachers. To add a hearing peer group to the analysis, narrative and expository samples were retrieved from the Oregon Department of Education Website (http://www.ode.state.or.us). The medium-low, medium, and medium-high 3rd, 4th, and 5th grade anchor papers were downloaded from the site, resulting in a total of 18 samples from hearing peers.

I (Jennifer Renée) conducted a SFG experiential analysis of the language in these samples (*N* = 70). I coded the participants in red, the processes in green, and the circumstances in blue. After these linguistic structures had been identified, I used traditional grammar labels (e.g., 1st person pronoun, definite article+noun, noun +prepositional phrase) as inductive sub-codes (Miles, Huberman, & Saldana, 2014) to further categorize the structures in tables. Next, I compared the findings between groups and between genres, looking for differences in the linguistic structures used. I found that there were clear differences across groups. For example, students in the low group were most likely to use one-word nouns while students in the high group often expanded before or after the noun. There were also differences between genres. For example, in recount writing students used more structures containing personal pronouns and more structures containing past tense verbs than they did in information report writing. We concluded that experiential analysis was an effective way to identify and compare the syntactic structures used by students at varying levels of language proficiency.

#### 3.3 Development and field-testing of evaluation tools

In Fall 2013, we shared the findings with the teachers, and one teacher stated that it would be beneficial for her to have this information in "some sort of ladder" to help her identify what types of skills might be "appropriate next steps." Using her idea and the findings from the analysis, I developed *Language Progression Charts* to depict the general progression of the noun, verb, and adverb structures students used to construct sentences. In Spring 2014, we introduced a group of teachers (N = 4) to the charts. During a weekend professional development, the teachers used them to analyze their students' writing samples and set language objectives with us. They then continued to use them to analyze student writing throughout the remainder of the semester. At the end of the year, we conducted interviews and asked teachers to reflect on their use of the charts, SFG experiential analysis, setting language objectives, and their instructional practices. The following themes emerged from an analysis of these interviews:

- 1. Engaging in experiential analysis informs teachers' understandings of students' present levels of performance.
- 2. Using a progressive chart that includes grammar structures of proficiency groups and of typically developing students contextualizes students' performance and guides the development of the next objective.
- 3. Bridging knowledge gained from experiential analysis and changing instructional practices requires modeling of application-based strategies.
- 4. Applying experiential analysis and setting next objectives based on the analyses requires substantial time.

The first study demonstrated that findings of SFG experiential analysis could be used to map out a general progression of written language development. It also demonstrated that the information gained from this type of analysis helps teachers set instructional objectives for deaf students. However, the time required to learn and engage in this type of analysis is substantial, making it a somewhat impractical method of evaluation for classroom teachers. These conclusions led to a second study aimed at developing a written language inventory informed by SFG analysis. This type of inventory has the potential to allow teachers to benefit from the advantages of SFG analysis, without requiring extensive time for training and analysis.

#### 4 | STUDY 2

#### 4.1 | Analysis methods

The purpose of the second study was to use SFG experiential analysis to map out a general trajectory of deaf student written language development and to use this information and feedback from current teachers to develop a written language inventory for deaf students. While the first study had begun to map out a trajectory of written language development using SFG experiential analysis, the sample size was small and all of the deaf students attended the same school. A second SFG experiential analysis was necessary to ensure that the content of the inventory would be based on findings more representative of the population. For the second study, we collected samples from a larger, more diverse group of participants. While the findings from the first study indicated that genre does impact the use of syntactic structures, we needed to limit the analysis to one genre. We selected information report because we felt this information would be relevant for all teachers of the deaf. Students are expected to use information writing not only in Language Arts, but also in content area classes (e.g., Social Studies, Science).

In Fall 2014, we collected information report writing samples from a total of 106 participants in 3rd-5th grades. These students were participants in the experimental or comparison groups in the 3rd year of the SIWI development project. Seventy-four of the students had a hearing loss ranging from mild to profound, while 34 of the students had normal hearing. The deaf students attended school in a variety of settings (i.e., neighborhood

schools, site-based programs, day schools for the deaf, and residential schools for the deaf) that used a variety of communication philosophies. The participating deaf classes included five bilingual classes, four Total Communication classes, and four Listening and Spoken Language classes. These classes were located in urban, suburban, and town areas in eight states. The participating hearing comparison classes included one 3rd grade class, one 4th grade class, and one 5th grade class at an elementary school located in a large urban metropolitan area in the Southeast. According to Public School Review (n.d), the school had a minority enrollment of 46%, and 72% of the students attending the school were eligible for free or reduced lunch in 2012–2013.

Before coding the data, the samples were organized into four equally sized groups based on written language proficiency. Grade level standard scores on the Broad Written Language cluster of the *Woodcock-Johnson III* Achievement Test (WJIII; Woodcock, Schrank, Mather, & McGrew, 2007) were used to create the groups. Students with a standard score of 1-50 were placed in the low language proficiency group (N=25). Students with a standard score of 51-70 were placed in the mid language proficiency group (N=24). And students with a standard score of 71-110 were placed in the high language proficiency group (N=24). Because writing samples had been collected from 32 hearing students, we needed to eliminate samples from the hearing peer group to have an equal group size. Z-scores were used to identify the 7 students whose WJIII scores were the farthest from the mean and eliminated samples from students with a z-score larger than +/-1.13 to create an approximately equally sized hearing peer group (N=25). All of the deaf groups included five or more students from each grade, indicating that there was not a strong correlation between deaf students' grade levels and written language maturity.

I (Jennifer Renée) then used the qualitative and mixed methods research software program, NVivo for the analysis. I uploaded the 98 writing samples to the program and divided each sample into clauses. Then, I began a 2-level experiential analysis using nodes (i.e., codes) to label syntactic structures. In the first level of analysis, experiential metafunction labels (*participant*, *process*, and *circumstance*; Halliday & Matthiessen, 2014) were used as a predetermined coding scheme. In the second level of analysis, inductive codes (Miles et al., 2014) were used to describe the structures. These codes consisted primarily of traditional grammar labels. For *circumstances* (i.e., adverbs), question word labels (e.g., *when?*, *where?*, *how?*) were also used.

Because deaf student writing typically contains errored attempts to construct syntactic structures, I had to determine how errored constructions would be coded. I decided to code word groups according to the targeted structure that a student attempted. For example, one student wrote "My brother want play Candyland," instead of "My brother wanted to play." Although "want" should have been a past tense stative verb, I coded the *process* "want play" as *other stative—present* rather than *other stative—past* because the student had not made an attempt to construct a past tense verb. However, I also coded it as *verb+infinitive* because the student had made a clear attempt to combine the two verbs (want and play) in this way. In addition to the two tiers, I also coded for errors. In the example above, I also coded "want play" as *incorrect tense*. In addition to the experiential analysis, we compared the samples between groups, looking at writing level differences.

#### 4.2 | Findings

There were clear qualitative differences between the writing of each group. The students in the low group were emergent writers—four students drew pictures and did not write any words; four students wrote lists of words; and 16 students combined words in an attempt to construct simple sentences. The students in the mid group were beginning writers—the majority conveyed their ideas through simple sentences; about half organized their sentences into paragraphs with a beginning, middle, and end; and three students wrote multiple paragraphs. The students in the high group were more developed writers—the majority organized their sentences into a paragraph with a clear beginning, middle, and end; six students wrote multiple paragraphs; and the majority used one or more complex sentences. The students in the hearing peer group were more independent writers—the majority wrote multiple paragraphs, and almost all students used complex sentences in their writing. In addition to these qualitative differences, the experiential analysis revealed quantitative differences in the language of each group.



#### 4.2.1 | Nouns/Participants

The majority of the words written by students in all groups were classified as participants. Furthermore, all of the students who wrote words in their sample used participants. As expected, the number of participants used by each group and total number of words used to construct those participants increased by group. In addition, the variety of structures used by the students increased at each level of proficiency (see Table 1).

Students in the low group used mostly 1st person subject pronouns (e.g., I), proper nouns (e.g., Disney World), and common nouns (e.g., school) without expansion. When they did use expansion, they were most likely to use classifiers, or nouns that are used like adjectives, before the noun (e.g., race car, chicken soup).

The students in the mid group used 147% more participants than the low group, and the average length of their participants was 23% longer. They were more likely than those in the low group to use plurals (e.g., *sports*) and 3rd person subject pronouns (e.g., *they*) and to join nouns with conjunctions and comma series (e.g., *pizza*, *cake*, *and ice cream*). Students in the mid group were also much more likely to expand before nouns, primarily with describers and possessive pronouns. For example, a student in the mid group might write "the fluffy, white dog" or "our dog" instead of just "dog."

Although the students in the high group used only 8% more participants than the mid group, the average length of their participant word groups was 39% longer. Students in the high group were more likely than those in the low and mid groups to use 2nd person subject pronouns and object pronouns. They were also more likely to use indefinite and definite articles and quantifiers to expand before the noun. For example, a student in the low group might write, "I saw cars.", but a student in the high group might write, "I saw the cars." or "I saw many cars." In addition, while incidents of expansion after the noun were rare in the low and mid group, 57% of students in the high group used expansion after the noun, by adding prepositional, nonfinite, and finite phrases. For example, instead of "I saw cars.", a student in the high group might write, "I saw many cars lined up in the big field."

The hearing peer group used 125% more participants than the high group, and the average length of their participants was 27% longer. The average (mean) length of a participant written by deaf students in the mid group was 1.85 words, while the average length of a participant written by hearing peer students was nearly double at 3.28 words. Hearing peer students use several structures that were not often used by the deaf students in any group. They used the existential there (e.g., *There* are four types of sharks.), used demonstrative pronouns (e.g. that teacher) and partitives (e.g. piece of cake) to expand before nouns, and used examples to expand after nouns (e.g. superheroes, *like Spiderman*). They also used imbedded clauses as participants (e.g., Ms. Galloway, who is very funny and nice, is my math teacher).

#### 4.2.2 | Verbs/Processes

With the exception of the students in the low group who drew pictures or wrote lists, all students used processes in their writing. After participants, processes made up the second highest percentage of word use for students in the low and mid groups. The number of uses of processes increased between each group; however, the difference in the average length of processes did not follow a consistent pattern (see Table 2).

Students in the low group primarily used present tense action (e.g., run) and stative verbs (e.g., is) with some uses of modal helping verbs (e.g., should run). The students in the low group did not use a wide variety of verbs. The verbs is, have, like, eat, play, see, work, and run accounted for over half of the verbs used by the group. The average

TABLE 1 Noun/Participant use

Group	# of students	# of uses	Total # of words	Avg # of words	% of total words
Low (N = 24)	20	174	264	1.51	58.3
Mid (N = 25)	25	429	794	1.85	68.0
High (N = 25)	25	464	1,198	2.58	52.9
Hearing peer (N = 24)	24	1,044	3,433	3.28	58.4

TABLE 2 Verb/Process use

Group	# of students	# of uses	Total # of words	Avg # of words	% of total words
Low (N = 24)	16	98	154	1.57	34.5
Mid (N = 25)	24	164	228	1.39	19.5
High (N = 25)	25	216	333	1.54	14.7
Hearing peer (N = 24)	24	525	1,062	2.02	18.1

length of processes used by students in the low group was longer than the average length of those used by students in the mid group and slightly longer than those used by students in the high group. While the majority (76%) of the processes used by students in the low group were only one word, several longer structures used positively skewed the mean word length of processes because there were only 98 processes used by this group. For example, one student wrote, "But you guy have to do take turns and do not cut in the line." The construction of the process is errored but is an attempt at using a very complex process structure with many words.

The mid group used 67% more processes than the low group, but the average length of their processes was 11% shorter, which may indicate that the processes written by the mid group contained less errors. Students in the mid group were more likely to use the present tense of the stative verbs "to be" and "to have" and to use processes containing infinitives, such as *like to play*.

The high group used 32% more processes than the mid group, and the average length of their processes was 11% longer. Students in the high group were more likely to use processes that contained prepositions, such as *give up*.

The hearing peer group used 144% more processes than the high group, and the average length of their processes was 31% longer. Students in the hearing peer group were more likely to use helping verbs including primary helping verbs and semimodal helping verbs.

#### 4.2.3 | Adverbs/Circumstances

While participants and processes are necessary components of a sentence and therefore used by the majority of students in all groups, the use of circumstances is "optional" and was not demonstrated in all students' writing. Similar to participants, the number of uses and the average number of words of circumstances increased significantly from low to high and hearing peer groups. And, the largest differences found between groups were in this area (see Table 3).

Only 29% of students in the low group used circumstances. Students in the low group primarily used one-word circumstances to tell *where* (e.g., here, upstairs, outside).

Approximately 56% of students in the mid group used circumstances, and they used them 211% more than the low group. The average length of their circumstances was 47% longer than those of students in the low group. Students in the mid group used circumstances to tell both *where* and *when* and were more likely to use prepositional phrases (e.g., on the couch, in class).

About 84% of students in the high group used circumstances. The high group used 166% more circumstances than the mid group, and the average length of their circumstances was 89% longer. Students in the high group used

TABLE 3 Adverb/Circumstance use

Group	# of students	# of uses	Total # of words	Avg # of words	% of total words
Low (N = 24)	7	18	32	1.77	6.2
Mid (N = 25)	14	56	146	2.61	12.5
High (N = 25)	21	149	733	4.92	32.4
Hearing peer (N = 24)	24	261	1,385	5.30	23.6

circumstances to tell where, when, why, how (e.g., quickly, in one gulp), or with what condition (e.g., when we run, if I need help). Students in the high group were 58% more likely, than those students in the low or mid groups, to use circumstances to compose dependent clauses (e.g., After we won the game, we went to eat).

All students in the hearing peer group used circumstances. They used 75% more circumstances than the high group, but the average length of their circumstances was only 8% longer. The hearing group used circumstances for one additional reason: to tell *how often* (e.g., always, sometimes). Hearing peer students were 28% more likely than students in the high group to use dependent clauses, and they wrote more than twice as many complex sentences. After participants, circumstances made up the second highest percentage of word use for students in both the high group and hearing peer group.

#### 4.3 Development and field-testing of written language inventory

The findings of the experiential analysis were used to map out a basic trajectory of the written language development of deaf students, by placing the structures found in the analysis in order of frequency of use from low, to mid, to high, to hearing peer group. This trajectory was used to create a Written Language Inventory (WLI) that contained both an Individual Student Checklist (see Figures 2–4) and a Class Objective Setting Guide. See Kilpatrick (2015) for the full inventory. In the 2014-15 school year, the eight teacher participants in the third-year of the SIWI project field tested a draft of the WLI. They were introduced to this type of analysis during a professional development session in Summer 2014, using the tools developed in Study 1. During Fall 2014, a member of the research team visited each of the teacher's classrooms and brought a draft of the WLI. With support from the research team member, each teacher used the WLI to evaluate their students' writing and set language-level objectives. During this process they provided feedback on the inventory sharing initial questions, comments, and suggestions which were documented in the research team's shared field notes. Throughout the year, they continued to provide feedback during bi-weekly virtual meetings and email messages. All feedback was added to the field notes. A review of these notes showed that participants perceived the inventory to be a helpful

#### Individual Student Checklist

	Structure	Correc	t Uses	Incorrect Attempts & Other Notes
	1st Person Subject Pronouns (1, we)			
	Proper Nouns (Ashley, New Jersey, Disneyworld)			
	Common Nouns (tree, car, summer)			
	Plural Nouns (classes, iPads, cheerleaders)			
	*Classifier/Describer + Noun (small dog, good book, dirt track, car crash)			
	*Multiple Nouns/Pronouns (cats and dogs; Dad, Mom, and Jill)			
r 1	*Possessive Noun/Pronoun + Noun (Tori's pencil, Mom's car)			
Tier	Present Tense Action (jump, kick, go)			
	Present Tense Stative Verbs (except "to be) (have, like, know, think)			
	Present Tense "to be" (is, am, are)			
	Will or Can + Verb (will walk, can walk)			
	Would or Could or Should + Verb (would walk, could walk, should walk)			
	*Verb + Infinitive (try to dance, like to play, tend to smile)			
	Where? (here, downstairs, outside)			

FIGURE 2 WLI individual student checklist page 1. WLI, written language inventory

	*When?	-		_	
	(later, before, last year, one day)		П		
	*Where? Prepositional Phrases (at home, in class)				
	*When? Prepositional Phrases (on Dec 25th, at 5pm)				
	2 <sup>nd</sup> & 3 <sup>rd</sup> Person Subject Pronoun (you, he, she it, they)				
	Object PN (me, you, him, her, it, them)				
	Demonstrative Pronoun (this, that, these, those)				
	Article + N (the zoo, a book, an author)				
	Quantifier + N (four kids, some days, many cats)				
	N + Prep Phrase (the girl with blonde hair, the book on the table)				
Tier 2	N + Relative Phrase (the woman who lives there, the dog that barks)				
Œ	Past Tense Stative (was, were, had, have, liked, seemed, knew)				
	Past Tense Action (jumped, kicked, went)				
	Verb + Preposition (clean up, sit down, breathe in)				
	Simple Future Stative Verbs (will be, will have, will know)				
	Simple Future Action Verbs* (will jump, will kick, will walk)				
	With what condition? Dependent Clause (If I need help, when we run)				
	(if I need neip, when we fun)				

FIGURE 3 WLI individual student checklist page 2. WLI, written language inventory

	When? Dependent Clause (after they won, when he called)	] [	
	Why? Dependent Clause (because I like dogs)	] [	
	How? & How Prepositional Phrase (fast, with one gulp, in a good way)	] [	
	N + Nonfinite Phrase (the boy swimming in the park)		
	Partitive + N (a piece of pie, a slice of pizza)		
	Demonstrative + N (this bag, that box)	] [	
	Existential There (There are 50 states).		
	Question Word N Clauses (Knoxville is where I live.)		
_	Other N Clauses (I think he plays football.)	] [	
Tier 3	Perfect Tense Verbs (have run, will have run)	] [	
	Continuous Tense Verbs (is walking, was walking, will be walking)	] [	
	Semi-Modal Helping (be able to, have to, going to, used to)	] [	
	Verb + Noun + Verb (let us read, make you work)	] [	
	Perfect Progressive Verbs (have been walking, will have been walking	] [	
	Like who or what? (like Ms. Smith, like a diamond)	] [	
	How often?  (always, never, once, sometimes)		

FIGURE 4 WLI individual student checklist page 3. WLI, written language inventory

assessment tool. They indicated that the inventory provided them with a clearer picture of their students' linguistic repertoire, allowing them to identify areas of need. Kendall said, "I think this format is very user friendly, it is easy to see what skills are needed for each child and the class." They also indicated that using the inventory helped them to set objectives and plan instruction. Jane reported, "They (the components of the inventory) are helpful because I was able to target some quick fix goals like increasing adjective+noun and prep phrases to tell when." She went on to say, "I like it (the inventory) because it gives me very concrete ways to increase their writing abilities. The teachers provided suggestions for change, and revisions were made to the inventory based on their feedback.

#### 5 ONGOING RESEARCH

Although Study 2 concluded in May 2015, this research project is ongoing. In Summer 2015, we held the final professional development workshop for the SIWI development project and introduced a group of teacher participants (*N* = 14) to the WLI. Some of these teachers had been involved in Study 1 and/or Study 2; however, more than half of the teachers had not seen earlier drafts of WLI. At the beginning of the workshop, participants were given three writing samples and asked to make observations about the writing sample and to set objectives based on these observations. During the workshop, the teachers were introduced to the WLI and engaged in guided practice using the inventory with their own students' samples. At the end of the workshop, they were again given the three writing samples and asked to make observations about the writing samples and to set objectives based on these observations. A comparison of the pre- and postobservations and objectives showed distinct differences. The pre-observations and objectives focused on general skills, such as capitalization, spelling, "English word order," "sentence structure," and subject-verb agreement. The postobservations focused on the use of specific language structures, such as past tense action verbs, present tense stative verbs, pronouns, and prepositional phrases. These findings indicate that using the WLI could impact instructional practices.

#### 6 | LIMITATIONS AND FUTURE DIRECTIONS

The findings of the analysis were used to construct an inventory that reflects a "scope and sequence" of the written language development of deaf students. As mentioned in Section 1, this was done with developmental variation in mind. We acknowledge that individual children are unique. They pass through the stages of language and literacy development in a variety of ways, taking different paths to proficiency (Clay, 1982, 1998, 2001; Teale & Sulzby, 1986). Hierarchies are a way of understanding the general progression that occurs in language learning. However, language is extremely complex, variable, and nonlinear. Educators turn to hierarchies because they need some sort of guidance to set objectives and plan instruction. They need to know what the logical "next steps" might be. When hierarchies are used, educators must use them responsibly by keeping in mind that they are a framework and not a rigid sequential checklist. Easterbrooks and Baker (2002) wrote, "Any attempt to align all the components and systems of language into one overall sequence would violate this basic premise of child development. Be that as it may, teachers need a framework for decision making." The purpose of this inventory is to provide such a framework.

We are continuing to refine the inventory to reduce the time and effort it takes teachers to evaluate students' writing. A syntax assessment like the WLI requires teachers to have sufficient knowledge of grammar, or it can seem confusing or lengthen the time needed. We have continued to revise the inventory and have added visual scaffolds that make the inventory more accessible for both teachers and students. We are also working to develop an indexed resource manual that would allow a teacher to easily locate descriptions and examples of unfamiliar constructions, and thus identify the presence or absence of constructions in their students' writing more readily.

Our study findings suggest that the WLI gives teachers a new tool for evaluating their students' written language that allows them to describe students' language strengths and needs in new ways, and this results in teachers setting different kinds of language objectives than they had set previously. It's unclear, however, if using the WLI has an indirect impact on their instruction. Future studies should examine this. Without instructional resources that are aligned with the WLI, it may be challenging for teachers to address objective areas during instruction. Next steps would be to develop instructional resources and materials that could support the instruction of WLI-based objectives, similar to the instructional materials available for other literacy assessments such as the Qualitative Reading Inventory and Words Their Way. This will involve the development of lesson and video examples in English and ASL, as well as mentor text resources with the language constructions embedded and identified. Since the use of language is genre and context specific (Schleppegrell, 2007), we also plan to develop genre-based recommendations and resources for the WLI.

#### 7 | USING THE INVENTORY

While the research on the implementation of the inventory is ongoing, our initial research has indicated that it has the potential to impact instruction. Because the purpose of the inventory is to provide teachers of the deaf with an assessment tool that can inform instruction, we conclude this article with a brief description of how the WLI is intended to be used to help teachers to both identify what meaning making tools students have in their repertoire and facilitate the expansion of that repertoire.

First, a teacher takes several samples of writing and uses the tool to take inventory of the syntactic structures that the student is both using and using but confusing. If a student uses a particular structure (e.g., present tense action verbs) in multiple constructions without error, the teacher can identify this structure as one that is mastered. If a student attempts a particular structure (e.g., where? prepositional phrases) several times but the structure is typically errored (e.g., using "in the park" instead of "at the park"), the teacher can identify this structure as one that is not yet mastered.

After taking inventory of all of the structures, teachers can identify structures that have not yet been mastered and use them to set a language objective. Because students need multiple opportunities to both read and write structures for them to become part of their repertoire, teachers should select structures that are likely to appear in the types of reading and writing that is currently being done in the classroom. For example, if current instruction is focused on expository texts, one would not want to select *past tense action verbs* as an objective, as expository texts do not often include *past tense action verbs*.

Next, teachers can purposefully target objectives, teaching the conventions of written English during explicit instruction to help students build their metalinguistic awareness. Students must also have opportunities to read and write the targeted structure in authentic contexts. Therefore, teachers should provide opportunities for students to identify the targeted structure in mentor texts as they read throughout the day. They should also provide opportunities for students to use the targeted structure in their own writing. By using the inventory to guide instruction, teachers and students can become more aware of the syntactic structures used in various kinds of writing, and students can expand their language repertoire.

#### **ACKNOWLEDGMENTS**

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#### REFERENCES

- Aguirre-Muñoz, Z., Park, J. E., Amabisca, A., & Boscardin, C. K. (2008). Developing teacher capacity for serving ELLs' writing instructional needs: A case for systemic functional linguistics. Bilingual Research Journal, 31, 1–28.
- Allen, T. (1986). Patterns of academic achievement among hearing impaired students: 1974 and 1983. In Schildroth, A., & Karchmer, M. (Eds.), *Deaf children in American* (pp. 161–206). San Diego, CA: College-Hill Press.
- Antia, S. D., Ree, S., & Kreimeyer, K. H. (2005). Written language of deaf and hard-of-hearing students in public schools. Journal of Deaf Studies and Deaf Education, 10(3), 244–255.
- Bader, L. A., & Pearce, D. L. (2013). Bader reading & language inventory (7th ed.). New York, NY: Pearson.
- Bailey, A. L., & Heritage, M. (2008). Formative assessment for literacy, grades K-6: Building reading and academic language skills across the curriculum. Thousand Oaks, CA: Corwin/Sage Press.
- Beagle, P. S. (1968). The last unicorn. New York, NY: Viking Press.
- Bear, D. R., Invernizzi, M., Templeton, S., & Johnston, F. (2016). Words their way: Word study for phonics, vocabulary, and spelling instruction (6th ed.). New York, NY: Pearson.
- Van Beijsterveldt, L. M., & Van Hell, J. G. (2009a). Evaluative expression in deaf children's written narratives. *International Journal of Language & Communication Disorders*, 44(5), 675–692.
- Van Beijsterveldt, L. M., & Van Hell, J. G. (2009b). Structural priming of adjective-noun structures in hearing and deaf children. *Journal of Experimental Child Psychology*, 104(2), 179–196.
- Bredekamp, S. (Ed.). (1987). Developmentally appropriate practice in early childhood programs serving children from birth through age 8 (Exp. ed.). Washington, DC: NAEYC.
- Bransford, J., Darling-Hammond, L., & LePage, P. (2005). Introduction. In Darling-Hammond, L., & Bransford, J. (Eds.), Preparing teachers for a changing world: What teachers should learn and be able to do (pp. 1–39). San Fransisco, CA: Jossey-Bass.
- Clay, M. M. (1982). Observing young readers: Selected papers. Exeter, NH: Heinemann.
- Clay, M. M. (1998). By different paths to common outcomes. York, ME: Stenhouse.
- Clay, M. M. (2001). Change over time in children's literacy development. Portsmouth, NH: Heinemann.
- Coffin, C. (2010). Language support in EAL contexts. Why systemic functional linguistics (Special Issue of NALDIC Quarterly).

  Reading, United Kingdom: NALDIC.
- Commission on Education of the Deaf (1988). Looking to the Future: Commission on Education of the Deaf Recommendations. *American Annals of the Deaf*, 133(2), 79–84.
- Cunningham, A. E., & Stanovich, K. E. (1997). Early reading acquisition and its relation to reading experience and ability 10 years later. *Developmental Psychology*, 33, 934–945.
- de Villiers, J. G., & de Villiers, P. A. (2003). Language for thought: Coming to understand false beliefs. In Gentner, D., & Goldin-Meadow, S. (Eds.), *Language in mind: Advances in the study of language and cognition* (pp. 335–384). Cambridge, MA: MIT Press.
- Dew, D. (1999). Serving individuals who are low-functioning deaf: Report of the Twenty-Fifth Institute on Rehabilitation Issues. Washington, DC: George Washington University.
- Easterbrooks, S. R., & Baker, S. (2002). Language learning in children who are deaf and hard of hearing: Multiple pathways. Boston, MA: Allyn and Baker.
- Fontaine, L. (2013). Analysing English grammar: A systemic functional introduction. New York, NY: Cambridge University Press. French, M. (1999). Starting with assessment: A developmental approach to deaf children's literacy. Washington, DC: Laurent Clerc National Deaf Education Center.
- Gallaudet Research Institute (2013). Regional and National Summary Report of Data from the 2011-12 Annual Survey of Deaf and Hard of Hearing Children and Youth. Washington, DC: GRI, Gallaudet University.
- Geers, A., Moog, J., & Schick, B. (1984). Acquisition of spoken and signed English by profoundly deaf children. *Journal of Speech and Hearing Disorders*, 49, 378–388.
- Goodman, K. (1969). Analysis of oral reading miscues: Applied psycholinguistics. In Gollasch, F. (Ed.), *Language and literacy:* The selected writings of Kenneth Goodman (I, pp. 123–134). Boston, MA: Routledge & Kegan Paul.
- Halliday, M. A. K., & Matthiessen, C. M. I. M. (2014). *Halliday's introduction to functional grammar* (4th ed.). New York, NY: Routledge.
- Hart, B., & Risley, T. R. (1995). Meaningful differences in the everyday experiences of young American children. Baltimore, MD: Brookes Publishing.
- Hart, B., & Risley, T. R. (2003). The early catastrophe: The 30 million word gap by age 3. American Educator, 27, 4-9.

- Hartmann, R. R. K. (1996). Solving language problems: From general to applied linguistics. Exeter, Devon, United Kingdom: University Exeter Press.
- Ivimey, G. P., & Lachterman, D. H. (1980). The written language of young English deaf children. *Language and Speech*, 23(4), 351–377.
- Johnson, R. E., Liddell, S. K., & Erting, C. J. (1989). Unlocking the curriculum: Principles for achieving access in deaf education. Working Paper 89-3.
- Kilpatrick, J. R. (2015). Developing a written language inventory for deaf and hard of hearing students: A systemic functional grammar approach. (Doctoral dissertation), University of Tennessee. Retrieved from https://trace.tennessee.edu/utk\_graddiss/3433
- Koutsoubou, M. (2010). The use of narrative analysis as a research and evaluation method of atypical language: The case of deaf writing. *International Journal of Bilingual Education and Bilingualism*, 13, 225–241.
- Kretschmer, R., & Kretschmer, L. (1986). Language in perspective. In Luterman, D. (Ed.), *Perspectives in deafness*. San Diego, CA: College Hill Press.
- Leslie, L., & Caldwell, J. S. (2017). Qualitative reading inventory (6th ed.). New York, NY: Pearson.
- Mayer, C. (2010). The demands of writing and the deaf writer. In Marschark, M., & Spencer, P. E. (Eds.), The Oxford handbook of deaf studies, language, and education (2) New York, NY: Oxford University Press.
- Miles, M. B., Huberman, A. M., & Saldana, J. (2014). Qualitative data analysis: A methods sourcebook and the coding manual for qualitative researchers. Thousand Oaks, CA: Sage.
- Mitchell, R. E., & Karchmer, M. A. (2004). Chasing the mythical ten percent: Parental hearing status of deaf and hard of hearing students in the United States. *Sign Language Studies*, 4(2), 138–163.
- Moores, D. F. (1970). An investigation of the psycholinguistic functioning of deaf adolescents. *Exceptional Children*, *36*, 645–652.
- Moores, D. F., & Sweet, C. (1990). Factors predictive of school achievement. In Moores, D. F., & Meadow-Orlans, K. P. (Eds.), Educational and developmental aspects of deafness (pp. 154–201). Washington, DC: Gallaudet University Press.
- Musselman, C., & Szanto, G. (1998). The written language of deaf adolescents: Patterns of performance. *Journal of Deaf Studies and Deaf Education*, 3, 245–257.
- de Oliveira, L. C., & Dodds, K. N. (2010). Beyond general strategies for English Language Learners: Language dissection in science. The Electronic Journal of Literacy Through Science, 9, 1–14.
- de Oliveira, L. C., & Lan, S. W. (2014). Writing science in an upper elementary classroom: A genre-based approach to teaching English language learners. *Journal of Second Language Writing*, 25, 23–39.
- de Oliveira, L. C., & Schleppegrell, M. J. (2015). Focus on grammar and meaning. Oxford, United Kingdom: Oxford University Press.
- Paul, P., & Quigley, S. P. (1990). Education and deafness. London, England: Longman Publishing.
- Public School Review (n.d.). Public school review overview. Retrieved on April 13, 2014 from http://www.publicschoolreview.com/Rose, S., McAnally, P. L., & Quigley, S. P. (2004). Language learning practices with deaf children (3rd ed.). Austin, TX: PRO-ED, Inc.
- Schick, B., & Hoffmeister, R. (2001). ASL skills in deaf children of deaf parents and of hearing parents. Paper presented at the Society for Research in Child Development International Conference, Minneapolis, MN.
- Schick, B., & Moeller, M. P. (1992). What is learnable in manually coded English sign systems? *Applied Psycholinguistics*, 13, 313–340.
- Schirmir, B. R. (2000). Language and literacy development in children who are deaf. Boston, MA: Allyn & Bacon.
- Schleppegrell, M. (2007). The meaning in grammar. Research in the Teaching of English, 42(1), 121-128.
- Schleppegrell, M. J. (2013). The role of metalanguage in supporting academic language development. *Language Learning*, 63, 153–170.
- Strong, M., & Prinz, P. M. (1997). A study of the relationship between American Sign Language and English literacy. *Journal of Deaf Studies and Deaf Education*, 2, 37–46.
- Tabors, P. O., Snow, C. E., & Dickinson, D. K. (2001). Homes and schools together: Supporting language and literacy development. In Dickinson, D. K., & Tabors, P. O. (Eds.), Beginning literacy with language: Young children learning at home and school (pp. 313–334). Baltimore, MD: Paul H. Brookes Publishing Co.
- Teale, W. H., & Sulzby, E. (1986). Emergent literacy as a perspective for examining how young children become writers and readers. In Teale, W. H., & Sulzby, E. (Eds.), *Emergent literacy: writing and reading* (pp. vii–xxv). Norwood, NJ: Ablex Publishing Corporation.
- The National Agenda (2005). Moving forward on achieving educational equality for deaf and hard of hearing students. Retrieved on November 16, 2018 from http://www.ceasd.org/advocacy/national-agenda
- Thompson, G. (2014). Introducing functional grammar. New York, NY: Routledge.
- Traxler, C. B. (2000). The Stanford Achievement Test, 9th edition: National norming and performance standards for deaf and hard-of-hearing students. *Journal of Deaf Studies and Deaf Education*, 5(4), 337–348. https://doi.org/10.1093/deafed/5.4.337

Vygotsky, L. S. (1978). Mind in society. Cambridge, MA: Harvard University Press.

Wolbers, K., Dostal, H., Graham, S., Branum-Martin, L., Kilpatrick, J., & Saulsburry, R. (2018). Strategic and interactive writing instruction: An efficacy study in grades 3-5. *Journal of Educational and Developmental Psychology*, 8(1), 99–117. https://doi.org/10.5539/jedp.v8n1p99

Woodcock, R. W., Schrank, F. A., Mather, N., & McGrew, K. S. (2007). Woodcock-Johnson III tests of achievement. Rolling Meadows, IL: Riverside Publishing.

Yoshinaga-Itano, C., & Snyder, L. (1985). Form and meaning in the written language of hearing impaired children. *Volta Review*, 87, 75–90.

Yoshinaga-Itano, C., Snyder, L., & Mayberry, R. (1996). Can lexical/semantic skills differentiate deaf or hard-of hearing readers and nonreaders? *Volta Review*, 98, 39–61.

#### SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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# Written Language Inventory for Deaf and Hard of Hearing Students

(Kilpatrick, 2015)

**Purpose:** This assessment tool was developed to provide teachers of d/hh students with a way to take inventory of their students' written language repertoire by documenting the syntactic (grammatical) structures a child is using and attempting to use. Using this inventory can help teachers set written language objectives and provide developmentally appropriate written language instruction.

**Development:** The inventory was developed using the findings of a Systemic Functional Grammar (SFG; Halliday & Matthiessen, 2014) experiential analysis of the information writing samples of 74 d/hh and 24 hearing 3<sup>rd</sup>-5<sup>th</sup> grade students. The analysis identified the syntactic structures used most frequently by students at different stages of written language development. It was published in 2015 and revised in 2018.

**Syntactic Structure Labels:** In the inventory, structures are labeled in 2 ways. They are grouped by function into 3 groups represented by colors: nouns and noun phrases (red), verbs and verb phrases (green), and adverbs and adverbial phrases (blue). Within each functional group, structures have been named by their form using traditional grammar labels.

**Inventory Components:** There are three major components:

- Individual Student Checklist to be used to take inventory of the structures a student is using in his/her writing
- Class Objective Setting Guide to be used to group students and set class, group, or individual objectives
- Written Language Features Ladders to be used to allow students to see how language progresses in complexity.

### **Important Notes:**

- Language Development Language development is a complex process; children are unique and do not all take the same path to proficiency. Evaluators and teachers should keep in mind that this inventory is a guiding framework and students will not acquire the syntactic structures at the same pace or in the same order.
- Impact of Genre Language features of different genres vary. For example, past tense verbs are more likely to be used in recounts and narratives than they are in information report or persuasive writing. Teachers should keep the language needs of each genre in mind when setting objectives.

 Overlap of Categories - There could be overlap of some noun structure categories. For example "three cars" would be both quantifier + noun and plural noun.

**Definitions:** Traditional grammar labels have been used throughout the inventory. Examples have been provided to assist evaluators and teachers. Some labels with which professionals may be less familiar have been defined below. (A more complete reference manual is currently under development. It is being designed to provide detailed information and examples of each of the structures.)

- Classifier an adjective or noun that modifies a noun by further classifying the noun (ex. dirt track, car crash, science class)
- **Describer** an adjective that modifies a noun by providing information about the quality of the noun or the writer's attitude towards the noun (ex. small dog, good book, horrible day)
- Relative Phrase a postmodifying phrase that follow a noun and begin
  with a relative pronoun (who, whom, which, that), also referred to as
  relative clause (ex. the dog that barks)
- Nonfinite Phrase postmodifying phrase with the relative pronoun deleted, also referred to as reduced relative clause (ex. the dog barking)
- Partitive a structure which consists of two nouns linked by "of", allows a
  mass noun to be counted (ex. a piece of pie)
- **Stative Verb** a verb that expresses a state rather than an action, usually related to thoughts, emotions, relationships, senses, and states of being (ex. am, is, are, have, has, like, know, see)
- Modal Helping Verb a verb used in conjunction with a main verb to modify the verb in some way by expressing necessity, possibility, or time (ex. can run, should run, must run)
- **Semi-Modal Helping Verb** a combination of words which functions in the same way as a modal helping verb (ex. be able to run, have to run)
- Infinitive "to" followed by the simple form of a verb (ex. to run, to walk, to read)

**Verb Tenses:** In the English language there are 3 main verb tenses: past, present, and future. Each of these main tenses has 4 sub-tenses: simple, continuous, perfect, and perfect continuous. These 12 tenses are the tenses that are most commonly used and taught in English. Below there is a chart displaying examples of each of these verb tenses. Students begin to use simple present verbs in Tier 1, simple past and simple future verbs in Tier 2, and the remaining sub-tenses in Tier 3.

		Past	Present	Future		
Tiers 1 & 2	Simple	I <u>played baseball</u> last year.	I <u>play baseball</u> .	I <u>will play</u> baseball next year.		
	Continuous	I <u>was playing</u> baseball this morning.	I <u>am playing</u> baseball right now.	I <u>will be playing</u> baseball tonight.		
Tier 3	Perfect  I had played baseball for 2 years when I decided to quit.		I <u>have played</u> baseball for 3 years.	I <u>will have played</u> baseball for 10 years when I graduate.		
	Perfect Continuous	I <u>had been</u> <u>playing</u> baseball for 2 years when I decided to quit.	I <u>have been</u> <u>playing</u> baseball for 3 years.	I <u>will have been</u> <u>playing</u> baseball for 10 years when I graduate.		

# **Individual Student Checklist**

	Structure	Correct Uses	Incorrect Attempts & Other Notes
	1st Person Subject Pronouns (I, we)		
	Proper Nouns (Ashley, New Jersey, Disneyworld)		
	Common Nouns (tree, car, summer)		
	Plural Nouns (classes, iPads, cheerleaders)		
	*Classifier/Describer + Noun (small dog, good book, dirt track, car crash)		
	*Multiple Nouns/Pronouns (cats and dogs; Dad, Mom, and Jill)		
ř.	*Possessive Noun/Pronoun + Noun (Tori's pencil, Mom's car)		
Tier	Present Tense Action (jump, kick, go)		
	<b>Present Tense Stative Verbs</b> (except "to be) (have, like, know, think)		
	Present Tense "to be" (is, am, are)		
	Will or Can + Verb (will walk, can walk)		
	Would or Could or Should + Verb (would walk, could walk, should walk)		
	*Verb + Infinitive (try to dance, like to play, tend to smile)		
	Where? (here, downstairs, outside)		

	*When? (later, before, last year, one day)	
	*Where? Prepositional Phrases (at home, in class)	
	*When? Prepositional Phrases (on Dec 25th, at 5pm)	
	<b>2<sup>nd</sup> &amp; 3<sup>rd</sup> Person Subject Pronoun</b> (you, he, she it, they)	
	Object PN (me, you, him, her, it, them)	
	Demonstrative Pronoun (this, that, these, those)	
	Article + N (the zoo, a book, an author)	
	Quantifier + N (four kids, some days, many cats)	
	N + Prep Phrase (the girl with blonde hair, the book on the table)	
Tier 2	N + Relative Phrase (the woman who lives there, the dog that barks)	
=	Past Tense Stative (was, were, had, have, liked, seemed, knew)	
	Past Tense Action (jumped, kicked, went)	
	Verb + Preposition (clean up, sit down, breathe in)	
	Simple Future Stative Verbs (will be, will have, will know)	
	Simple Future Action Verbs* (will jump, will kick, will walk)	
	With what condition? Dependent Clause (if I need help, when we run)	

	When? Dependent Clause (after they won, when he called)		
	Why? Dependent Clause (because I like dogs)		
	How? & How Prepositional Phrase (fast, with one gulp, in a good way)		
	N + Nonfinite Phrase (the boy swimming in the park)		
	Partitive + N (a piece of pie, a slice of pizza)		
	Demonstrative + N (this bag, that box)		
	<b>Existential There</b> (There are 50 states).		
	Question Word N Clauses (Knoxville is where I live.)		
	Other N Clauses (I think he plays football.)		
Tier 3	Perfect Tense Verbs (have run, will have run)		
	Continuous Tense Verbs (is walking, was walking, will be walking)		
	Semi-Modal Helping (be able to, have to, going to, used to)		
	Verb + Noun + Verb (let us read, make you work)		
	Perfect Progressive Verbs (have been walking, will have been walking		
	<b>Like who or what?</b> (like Ms. Smith, like a diamond)		
	How often?  (always, never, once, sometimes)		

## Class Objective Setting Guide

Directions - Write the students' initials in the first row. Then, use the individual student checklists to complete the chart.

- If a student has no uses of a structure, leave the box empty.
- If a student has 1 or 2 uses of a structure, place a / in the box.
- If a student has 3 or more correct uses of a structure, place an X in the box.

Tips – Use a different colored writing utensil each time you analyze samples so you can see growth over time. When setting objectives consider the language needs of each genre. For example, past tense verbs are more likely to be used in recount or narrative writing than in other genres.

	Student Initials					
	1st Person Subject Pronouns					
	Proper Nouns					
	Common Nouns					
	Plural Nouns (Irregular & Regular)					
	Classifier/Describer + Noun					
	Multiple Nouns/Pronouns					
	Possessive Noun/Pronoun + Noun					
_	Present Tense Action Verbs					
Tier 1	Present Tense Stative Verbs (except "to be)					
	Present Tense "to be"					
	Will or Can + Verb					
	Would or Could or Should + Verb					
	Verb + Infinitive*					
	Where? Adverbs					
	When? Adverbs					
	Where? Prepositional Phrases					
	When? Prepositional Phrases					
	2 <sup>nd</sup> & 3 <sup>rd</sup> Person Subject Pronouns					
	Object Pronouns					
2	Demonstrative Pronouns					
Tier 2	Article + Noun					
_	Quantifier + Noun					
	Noun + Prepositional Phrase					
	Noun + Relative Phrase					

-	Simple Past Tense Action Verbs					T
	Verb + Preposition					-
-	Simple Future Stative Verbs					H
7	Simple Future Action Verbs*					T
	With what condition? Dependent Clause					T
	When? Dependent Clauses					T
-	Why? Dependent Clauses					1
	How? Adverbs – Level 2					T
	Noun + Nonfinite Phrase					
	Partitive + Noun					
	Demonstrative + Noun					T
	Existential There					T
	Question Word Noun Clauses					T
	Other Noun Clauses*					
Tier 3	Perfect Tense Verbs					
	Continuous Tense Verbs					Ī
	Semi-Modal Helping Verbs					Ī
	Verb + Noun + Verb					Ī
	Perfect Progressive Verbs					
	Like who or what?					
	How often? Adverbs					