



User's Manual for the
QUICK INTERACTIVE LANGUAGE SCREENER™

QUILS™



A Measure of Vocabulary, Syntax, and
Language Acquisition Skills in Young Children



Roberta Michnick Golinkoff • Jill de Villiers • Kathy Hirsh-Pasek
Aguiles Iglesias • Mary Sweig Wilson

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The Language Questionnaire used with the QUILS is described in Chapter 6. Users may make copies of the Language Questionnaire from an original User’s Manual or from the QUILS web site, provided each copy maintains the credit line shown at the bottom of Figure 6.1. Copies of the Language Questionnaire may be made to support use of the Quick Interactive Language Screener™ (QUILS™), provided the user is not charging a fee.

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Also available: *Quick Interactive Language Screener™: English–Spanish (QUILS™: ES)* and the *User’s Manual for the Quick Interactive Language Screener™: English–Spanish (QUILS™: ES)*. Visit www.quilscreener.com for more information.

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About the Contributors

Giovanna Morini, Ph.D., was a postdoctoral researcher in the School of Education at the University of Delaware on the Quick Interactive Language Screener™ (QUILS™) project. After working on the QUILS, she became a postdoctoral researcher at the University of Delaware and in the Center for Pediatric Auditory & Speech Sciences at Nemours Alfred I. duPont Hospital for Children funded by her own National Science Foundation (NSF) grant. Her research focuses on language development in monolingual and bilingual children, as well as in children who are born deaf or hard-of-hearing. She has coauthored several publications and presented her work at both national and international conferences.

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Preface

The Quick Interactive Language Screener™ (QUILS™) was developed over a 5-year period in response to the need for an evidence-based screening instrument to assess language in preschool and kindergarten children. In addition to helping compare children's language skills to those of their peer group, the QUILS can contribute to the early identification of children who are at risk for a language delay or disorder. Being able to understand and talk to teachers and peers is crucial for school success. Although there is agreement among researchers that language skills are the engine for many different types of development, no single test existed that could screen children quickly on different aspects of language, do so without a skilled examiner, and automatically report the scores. With the QUILS, we introduce such a screener, and we hope to reduce the number of children whose language delays or disorders might not be noticed until they hamper their school performance. Furthermore, identifying children who might need language remediation before formal school entry may make it possible to offer appropriate intervention earlier, when children can profit most. Our goal has been to develop an evidence-based, quick, and efficient language assessment that is culturally neutral and appropriate for 3-, 4-, and 5-year-olds.

Language is above all else creative: It is not a compendium of words and sentences for all occasions, like a tourist phrase book. Even as adults we learn new words every day from language context, and we continually put words together to create new sentences that express novel ideas. To join the human community, children must do this, too. And this ability to use fluent language predicts success in school and beyond. For all of these reasons, we set out to develop a screening instrument that would assess not just what children already know about language but also what they are capable of learning when given new information. We wanted to look at their vocabulary knowledge and syntax skills, what we call *products* of language development, but we also wanted to know about the *processes* by which they acquire that language knowledge. We wanted QUILS to screen for children's ability to learn new words and understand them in structures where the words have not been heard.

To accomplish all this, we assembled a team of experts. Expertise in test item construction was required to design items that would be appropriate and discriminating of ability at different ages, as well as artistically appealing and identifiable by children this young. We needed researchers who were deeply knowledgeable about child development and what children would tolerate, expect, or confuse so that we could select the test items as carefully as possible. It is easy to design a "target" item on a test, but what should the alternative pictures be? The "foils" (incorrect alternatives) have to represent choices children might plausibly make if they are guessing or don't really know the meaning of the word or sentence. Statistical expertise was essential, too, to determine

which items “worked” and which items had to be discarded; to determine whether we had appropriate discriminative power across age and ability levels, and to help us choose the sample of monolingual English-speaking children for norming the test.

In addition, we wanted to develop a version of the screener to use with young children who are English–Spanish speakers. For this reason, we required linguistic expertise in Spanish as well as English, and expertise in dialects of both languages so that we could avoid biasing the test toward one or more English or Spanish dialects. The Quick Interactive Language Screener™: English–Spanish (QUILS™: ES) is a separate instrument with its own User’s Manual, also available from Brookes Publishing (see the copyright page for more information).

We hope we have provided a language screener that will help identify as early as possible those young children who have language delays. This early identification is the first step to helping young learners succeed in language skills, school readiness, and later success in life. We hope you will use the QUILS to evaluate whether all children have language skills appropriate for their age group.

For the Reader: Essential Elements to Understanding the QUILS

Po The Porcupine



Meet Po the Porcupine! Po is the friendly character displayed throughout the User's Manual next to essential information about the Quick Interactive Language Screener™ (QUILS™). Although we recommend that you read the entire User's Manual before screening a student, Po appears next to key information that an administrator, teacher, or any adult supervising a screening should know before using the QUILS.



Po also appears inside a Q (as seen to the left) throughout the QUILS web site, www.quilscreener.com, as a shortcut to take you to relevant content from this manual that will assist you with using the QUILS.

Terminology

Screener, not Assessment

The QUILS was developed specifically as a screener to be used with all young learners ages 3;0 through 5;11. A screening instrument is a tool that is quickly and easily administered in order to identify students who might need additional, more extensive assessment. A screener should not be used to diagnose specific learning difficulties or delays; it should be used to determine which students may require a more detailed assessment. During an assessment, qualitative and/or quantitative information is gathered about an individual child to identify strengths and needs to make appropriate decisions for education intervention purposes.

Screener, Not Test

You will notice that the QUILS is not referred to as a test, but as a screener. This has been done deliberately to underscore that the QUILS should not be regarded as a detailed assessment of a young learner’s school performance but as a helpful check of the skills the student is acquiring. You are looking for a student’s progress, just as a pediatrician might check height or weight. With this kind of developmental check, you can then make decisions about how to best assist a child in his or her language comprehension and expression. Furthermore, by not calling the QUILS a test, you will help young learners, parents, and even other teachers feel more comfortable with taking or administering the QUILS. Experience has shown that many students regard the QUILS as a game!

Students as Young Learners

To reinforce that children of all ages are young learners, in this User’s Manual we refer to children as *students*, regardless of where they spend their days—schools, child-care facilities, clinicians’ offices, community programs, and even their homes.

3;0–5;11

If you are not a speech-language pathologist, you may not be familiar with the year;month convention for expressing age. This shorthand has been adopted throughout the User’s Manual to describe that a student is, for instance 4 years and 2 months old (4;2).

Structure of the Questions and Directives

The QUILS is organized into three *areas*, which are divided into *types*, made up of individual *items*. This hierarchy is as follows:

- ❖ *Areas*: There are three content areas that the QUILS screens: Vocabulary, Syntax, and Process.
- ❖ *Types*: Each area contains four types, unique to that area. For instance, the Vocabulary area consists of four types: Nouns, Verbs, Prepositions, and Conjunctions. The Syntax and Process areas are similarly structured. Within each type, there are two to five items.
- ❖ *Items*: There are 48 items in the QUILS, divided equally into the three areas. Each item is composed of one or two questions or directives. For example, “Who is weighing apples?” is one item. “Show me the blue fep” and “Can you show me another fep” also count as one item.

Audio Instructions and Spoken Directions

To help distinguish audio instructions heard in the QUILS from suggested prompts for the supervising adult to speak to the student, suggested prompts are formatted with quotation marks and italics (e.g., “*You’re doing a great job; just press a little bit harder*”). Recorded audio in the screener, which includes the questions and directives, appears in regular type with quotation marks (e.g., “Who is feeding the baby?”).

The Language Questionnaire

This version of the QUILS was designed to be used with students who are proficient primary English speakers. The Language Questionnaire ensures that a student meets these criteria before the screening is administered. This brief seven-question survey, completed by a parent or primary caregiver, quickly determines whether the QUILS is an appropriate screener for the student based on his or her English language proficiency. You can read more about the Language Questionnaire that accompanies the QUILS in Chapters 5 and 6. The Language Questionnaire may be completed more than once to reevaluate the student's language proficiency at a later date.

QUILS: English–Spanish

If a student shows proficiency in Spanish, the QUILS: ES is likely the more appropriate screener to use. Visit www.quilscreener.com for more information about the use of the QUILS: ES.

What Result Do You Get with the QUILS?

After screening, the QUILS web site automatically calculates raw scores for all three areas—Vocabulary, Syntax, and Process—as well as an overall score. Reports can then be generated from the student's results relative to age (3;0–3;11, 4;0–4;11, and 5;0–5;11). Reports offer standard scores and percentile ranks for each area and for the QUILS overall and provide recommendations for follow-up based on cutoffs in the percentile rankings by age group.



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We could not have developed a set of national norms without the assistance of Anthony Raden, Ph.D., and the Educare Schools (<http://www.theounce.org/what-we-do/educare>). Educare Schools are funded by the Ounce of Prevention Fund, whose mission is to help “all American children—particularly those born into poverty—to have quality early childhood experiences in the crucial first five years of life.” Raden understood the importance of language development to children’s success and helped us test the QUILS in Educare schools in Nebraska, Chicago, and Miami. Daryl Greenfield, Ph.D., of the University of Miami, who created his own assessment of early science knowledge, was eager to assist us as well in perfecting the QUILS because he, too, appreciates the key role that language plays in children’s learning. His staff gave the QUILS in schools in Miami as they tested his early science test. Further assistance in finding middle class dual language learners in Miami was provided by Erika Hoff, Ph.D., at Florida Atlantic University. We are grateful to the students from the University of Miami who helped us with data collection at those sites.

In addition, we used the QUILS screener at various stages of its development in Head Start programs and child care centers in Wilmington, Delaware; Philadelphia, Pennsylvania; and Northampton, Massachusetts. We thank their directors without whom we could not have completed the QUILS. We must thank the parents of the children who took the QUILS for allowing their children to participate in a project that we hope will benefit other children who come after them.

Our superb research team helped create the QUILS items, pilot-test them in our laboratories, and then administer the screener in the field for item tryouts. Our crew was more than dependable and responsible; they were creative, thorough, and extremely

thoughtful in assisting us in the screener's development. We thank the following individuals for their valuable assistance:

- ❖ *From the University of Delaware:* Hillary Miller, Sujeet Ranganathan, Kristina Strother-Garcia, Katie Ridge, and many wonderful undergraduates
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- ❖ *From Laureate Learning Systems, Winooski, Vermont:* Linda Smith and the artists on staff at Laureate, as well as Stephen Tupaj and Daniel Schibuk in programming



*To children the world over who accomplish the amazing feat of language learning
before they can tie their shoes—if they wear them*



An Introduction to the QUILS™

1

What Is the QUILS

The Quick Interactive Language Screener™ (QUILS™) is a screener designed to evaluate whether children are making language progress appropriate for their age group. The QUILS screens the language skills of English-speaking monolingual children from ages 3;0 through 5;11 years in both vocabulary and syntax, that is, how we put our words together to make sentences. (A separate QUILS for children who are bilingual in English and Spanish has also been developed. See the copyright page for more information.) Because these two domains of language—vocabulary and syntax—predict academic success (e.g., Eunice Kennedy Shriver National Institute of Child Health and Human Development [NICHD] Early Child Care Research Network [ECCRN], 2005), assessing preschool children offers important information about their preparation for school. The QUILS examines properties of language that research suggests are critically important for later academic success and that provide a well-rounded picture of children’s linguistic abilities (Language and Reading Research Consortium [LARRC], 2015). The QUILS will not only measure what children know at the time of screening (*language products*) but also children’s ability to use *language processes*, or strategies for learning new words and sentences. In this way, teachers and practitioners can determine whether children can quickly acquire new words and sentence structures. Because the QUILS compares children to their peers, it is useful for the early detection of children with potential language difficulties.

The QUILS capitalizes on technology for ease of administration and automated scoring. It can be given to large numbers of children in a short amount of time by a person with no special training, and it provides a new way to identify children at risk for language delays inexpensively and effectively. The QUILS, therefore, has important applications in educational, clinical, and research settings.



The QUILS was designed as a screening tool, not a comprehensive assessment of language development, and uses language comprehension to uncover children’s language knowledge. It is not designed to evaluate children’s articulation ability, language use skills (pragmatics), or language production. Rather, it gives a picture of whether children’s comprehension of language is where it should be without asking children who might be shy or reticent to respond orally to questions.

All of the items on the QUILS were chosen by experts in the science of child language development and are based on the most current research. The *foils* (i.e., the incorrect alternative answers) all represent choices children might plausibly make if they were guessing or had a false idea about the meaning of the word or sentence.

The QUILS is unique in that it is quick and easy to give and children like it. It is touchscreen based, gives the items, and stores the data. Therefore, schools can use the tool without specially trained personnel. The lively, cartoonlike animations are

exciting to children, and the use of a touchscreen computer or tablet allows for automatic recording of responses. Automated reports are provided at the individual child and group levels.

Why the QUILS Was Developed

Assessing whether a child’s language development is on track early is vital because of the important role that language plays in children’s overall development and the fact that foundational language skills should be acquired during the first few years of life.

Research demonstrates clear links between early language ability and children’s school readiness and academic success. For example, vocabulary skill in early childhood predicts school readiness and overall academic performance (Catts, Fey, Tomblin, & Zhang, 2002; Miller et al., 2006; Scarborough, 2001). Children with larger expressive vocabularies when they are toddlers display greater academic and behavioral functioning at kindergarten entry than children with smaller expressive vocabularies, even after controlling for social variables (Morgan, Farkas, Hillemeier, Hammer, & Maczuga, 2015). Children with smaller vocabularies than their peers in preschool are more likely to have poor reading outcomes in grade school, with long-term risks for problems with literacy, mental health, and even employment (Bleses et al., 2014; Catts et al., 2002; Glogowska, Roulstone, Peters, & Enderby, 2006; Law, Rush, Schoon, & Parsons, 2009; Tomblin, Zhang, Buckwalter, & Catts, 2000; Tomblin, Zhang, Buckwalter, & O’Brien, 2003).

Research has led to initiatives to boost the vocabularies of young children who are at risk for poor language and literacy outcomes, such as children growing up in poverty (Hart & Risley, 1995), but vocabulary is only part of the picture. Individuals also use language to express new feelings and ideas, to argue, to interpret instructions, to negotiate, and to learn from what other people tell them. These skills go beyond vocabulary; they entail knowing the ways words work together to form grammatical sentences that express nuances of meaning. Syntax is also a unique and powerful predictor of language and literacy outcomes. Research shows that children’s oral language ability in preschool—both syntax and vocabulary—is a stronger predictor of reading outcomes in first grade (NICHD ECCRN, 2005) and reading skill in third grade than vocabulary alone (Coll, 2005; LARRC, 2015; Scarborough, 2001).

Development of the QUILS was spurred by the need for a screener that 1) evaluates competencies in both vocabulary *and* syntax, 2) measures both products *and* processes, and 3) relies on the medium of language comprehension. Each of these is discussed in What the QUILS Measures.



The screener compares children to standardized norms based on their ages and can be used in educational settings to flag children who are falling behind in language development for follow-up assessment. It evaluates language domains that research suggests are critically important for later academic success (Coll, 2005; LARRC, 2015; Scarborough, 2001).

Who the QUILS Is For

The QUILS is appropriate for use with children ages 3;0 through 5;11 years and has been designed to quickly screen children’s language competence. It can be used by researchers, clinicians, and educators to identify whether children are on a typical language

acquisition trajectory or should be referred for follow-up assessment to determine if early intervention would be needed.

There are strong motivations that support early identification and intervention as the road to better language outcomes (see Scarborough, 2009, for a review). Early identification is crucial because research shows that children's early language skills (including vocabulary and syntax) are associated with better reading success in elementary school (Dickinson, Golinkoff, & Hirsh-Pasek, 2010; National Early Literacy Panel, 2008). Literacy skills, including phonological awareness, letter knowledge, and reading comprehension of narratives, are all associated with strong language skills. Research also suggests that early interventions have more impact than later interventions (Glogowska, Roulstone, Enderby, & Peters, 2000; Law, Kot, & Barnett, 1999; Ramey & Ramey, 1998; Roberts & Kaiser, 2015; Wake et al., 2011).

What the QUILS Measures

The QUILS measures vocabulary, syntax, product, and process of learning new language through language comprehension rather than language production. We describe each of these aspects of the QUILS design next.

Vocabulary and Syntax



The research literature explains that both vocabulary and syntax are necessary for children to understand their teachers in school, carry on conversations, and maintain social relationships (Cocking & Mestre, 1988; Conti-Ramsden & Botting, 2004; Lee, 2011; Scarborough, 2001). Effective language assessment instruments must tap both vocabulary and syntax as a first step to understanding children's language profiles. **The QUILS includes both a Vocabulary area and a Syntax area. Vocabulary refers to the words individuals use or understand.** It includes not only the names of ordinary things and actions but also the names of intangible things and relations, such as *promise* and *truth*, that children need to express their ideas and later comprehend text. Vocabulary also encompasses many parts of speech such as prepositions (e.g., *between*, *behind*). Whether a toy was dropped between the chairs or behind the chairs is a distinction that children need to be able to make. Conjunctions such as *before* and *because* are critical words that connect ideas. *He wiped the baby before she spilled the milk* is a different event from *He wiped the baby because she spilled the milk*. Differences among children in word comprehension in the second year of life appear to be associated with overall vocabulary development later on (Fernald, Perfors, & Marchman, 2006; Lee, 2011); yet, language competency is defined by much more than the words in a child's vocabulary.

Syntax is the way words are put together into sentences—the grammar. When words are combined, new meanings are achieved, such as the difference between *The sand swallowed the girl* and *The girl swallowed the sand*. Syntax allows the expression of fine differences in meaning: *The boy called the crazy dog* versus *The boy called the dog crazy*. By age 3, typically developing children are competent and creative users of syntax (Hoff, 2009). In preschool and kindergarten, syntactic knowledge allows children to distinguish the difference between answering *wh*-questions and yes-no questions, such as *Why did you do that?* versus *Did you do that?* Tense markers, an aspect of syntax, allow children to express differences in the timing of events, such as *The lady walked* versus *The lady is walking*. With syntax, children can specify referents they want to

talk about, as when they use adjectives (e.g., *the blue car, the red car*) or when they use prepositional phrases to mark the relationships between entities (e.g., *The bear is on the pillow* versus *The pillow is on the bear*.) Syntactic knowledge is a crucial component of children’s language skills, and a mere assessment of vocabulary knowledge does not fully represent children’s language development. Indeed, in the absence of syntax and in possession of only single words, an individual would talk like a hapless tourist in a foreign country.

Product and Process



The QUILS focuses on the products of linguistic knowledge, or what children already know about language when they start the screener, and on the process by which children learn language; that is, their proficiency at learning new vocabulary items and generalizing syntactic information. We consider products to be knowledge about language that children have already accumulated from their daily lives. Children have a unique store of vocabulary items and syntactic structures that they bring with them when they take the QUILS. Process is not about the words and syntactic structures children already know. Process refers to how children learn language. Some children can readily make inferences about the meanings of new words from context; others are not as good at this. Some children can learn a new syntactic structure on the fly whereas others need to hear it multiple times. Children who have the capability to rapidly learn new language information have an advantage over children who are slower to pick up language items used in the speech of those around them. Furthermore, children who know less language (product) may require types of intervention different from those for children who do not readily learn new vocabulary or syntax.

The QUILS looks at both product and process to ensure that the screener minimizes bias against children from groups who speak another variety of English (Johnson & de Villiers, 2009; Johnson, de Villiers, & Seymour, 2005; Weismer, 2000) or who appear to have delays in vocabulary development as a result of limited exposure to standard English language models. These children might have the same ability to learn new words and structures as speakers of mainstream English of the same age. For example, a child may have fewer vocabulary words than peers (e.g., perhaps due to limited exposure to language models) but be in line with his or her age group in terms of vocabulary acquisition skills, such as quickly acquiring a new word after a limited number of exposures. This child may benefit from simply increasing his or her exposure to rich language. Children with difficulties in acquiring new language, however, may require compensatory strategies. Although the results from this screener do not recommend interventions per se, distinctions seen between the Product items of the QUILS and the Process area may be useful to professionals. Children who have low scores in Products, for example, but are average in Process, have the machinery to learn language and lack only exposure to more high-quality language interactions. Those who have low Process and low Product scores are more likely to need help from a clinician.

Language Comprehension

Some children are identified as “late talkers” at age 2 or 3 years based on their low language production. However, research suggests many of these children go on to develop language typically (Dollaghan, 2013; Leonard, 2014). Language comprehension may provide a better predictor of which children will continue to

have problems (Leonard, 2014; Thal & Bates, 1988) and require some intervention. Parents and teachers can spot a child who is not speaking, but not all children who are late talkers require intervention; some children who appear to have language delays can comprehend language. Comprehension measures are at the cutting edge of children's linguistic capability (Hirsh-Pasek & Golinkoff, 1996; Seidl, Hollich, & Jusczyk, 2003; Weisleder & Fernald, 2009). Many parents notice this about their own children, who can understand complicated three-step commands before they can even produce two-word utterances. Thus, it is essential to probe children's language comprehension because it may serve as a more sensitive measure of language skill than children's language production.

Relying on language production can be problematic because young children may have limited expressive capacities and are often reluctant to demonstrate their full expressive potential in an assessment context with an unfamiliar examiner (Brown, 1973). Comprehension measures do not require children to form a relationship with the examiner so that they will be willing to talk.



In addition, the minimal response demands of comprehension—in the case of the QUILS, touching the correct picture on a screen—are much lower than those of production and do not require coders to make judgments in the face of children's nonstandard pronunciations. With the QUILS, all children need to do is touch the screen to indicate their response. The QUILS invites children to play a game in which there are brightly colored pictures and animated scenes. It circumvents the problem of coaxing children to speak or to answer questions posed by a stranger. Children engage with the touchscreen computer or tablet in a way that is fun and yet reveals their language skill.

For all these reasons, comprehension screening of both vocabulary and syntax provides an essential picture of child language development.

Structure of the QUILS



The QUILS is arranged according to the three areas described below: Vocabulary, Syntax, and Process. The Vocabulary and Syntax areas cover the products of language knowledge, whereas the Process area covers how children learn new language items. Each area measures different types of language knowledge:

- ❖ *Vocabulary area:* screens children's knowledge of Nouns, Verbs, Prepositions, and Conjunctions
- ❖ *Syntax area:* measures children's knowledge of *Wh*-Questions, Past Tense, Prepositional Phrases, and Embedded Clauses
- ❖ *Process area:* examines children's Noun Learning, Adjective Learning, Verb Learning, and Converting Active to Passive

In each type, there are 2–5 items for a total of 16 items in each area (see Figure 1.1), or 48 items in total for the complete QUILS. In this way, the QUILS examines different aspects of the three major language skill areas.

Following is a brief description of the content of each area of the QUILS. Refer to Chapter 4 for a more detailed discussion of the areas, types, and items that make up the QUILS.

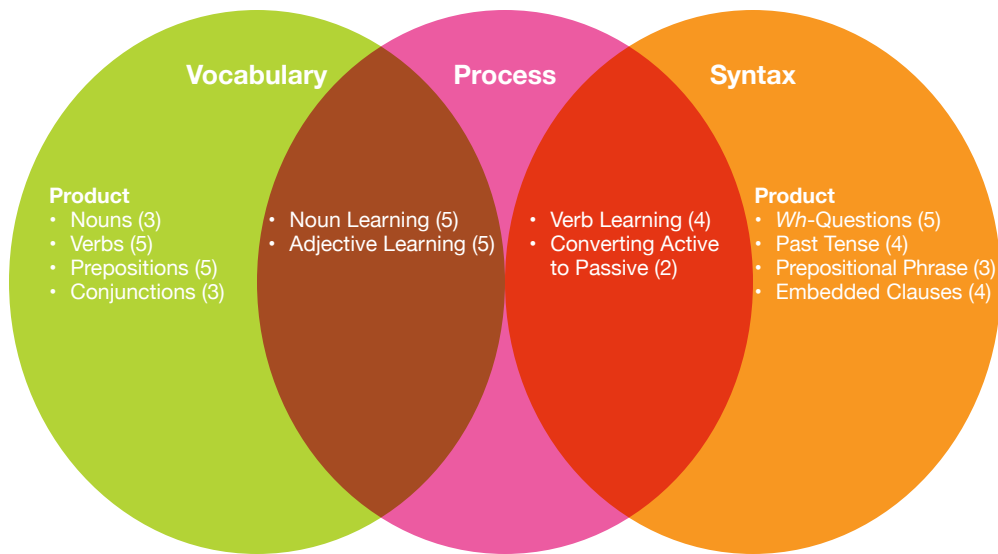


Figure 1.1. The structure of the QUILS, showing the basic Product–Process division, the three areas (Vocabulary, Syntax, and Process), and the types within each area (in parentheses are the numbers of items in each type).

Vocabulary Area

The Vocabulary area of the QUILS looks for the words that children have already learned, that is, children’s existing knowledge when they come to take the screener. The items in the Vocabulary area are grouped into four types:

- ❖ *Nouns*: This type includes nouns that name objects, people, and events (e.g., *fireworks*).
- ❖ *Verbs*: This type includes verbs (in present progressive verb form) that name actions (e.g., *unlocking*) and states (e.g., *leaning*).
- ❖ *Prepositions*: This type includes spatial prepositions that are important for describing physical relationships between objects (e.g., *below*, *behind*, *between*, *in front of*).
- ❖ *Conjunctions*: This type includes conjunctions used in connecting clauses that 1) refer to the order in which events occur (e.g., temporal conjunctions like *before*, *while*, and *after*, as in *John painted before the baby cried*) and 2) that refer to causal relationships (e.g., *because*, as in *She picked up the cake because the baby ate it*).

Syntax Area

The Syntax area examines children’s knowledge of sentence structure. Many children have heard the structures that this area screens and may already use them. The items in the Syntax area are grouped into four types:

- ❖ *Wh-Questions*: This type includes items that check whether children understand simple *wh*-questions (e.g., *what*, *who*) and complex *wh*-questions (e.g., *how*, *why*, as in *Why is the girl scattering corn?*).
- ❖ *Past Tense*: This type measures children’s understanding of sentences about past actions, states, and locations. This type probes whether children can distinguish between *He was eating* and *He is eating*.

- ❖ *Prepositional Phrases:* This type examines children’s understanding of descriptions with multiple modifiers that include prepositions and adjectives. A phrase such as *The kitten in a cup with a yellow ribbon* requires that children understand both the prepositional phrases (*in a cup, with a yellow ribbon*) and what the adjective (*yellow*) modifies to make the correct choice.
- ❖ *Embedded Clauses:* This type measures children’s understanding of complex sentence structures. In a question, such as *What did Maria say that the baby ate?* children must attend to the verbs in both clauses (*say, ate*) and understand how together they provide the right answer: it is not just what the baby ate, but what Maria *said* the baby ate, and those answers could be different because Maria might have made a mistake.

Process Area

The ability to learn new language on the spot is as crucial for school success as is children’s existing language knowledge (Newman, Rowe, & Ratner, 2015; Scarborough, 2001; Zosh, Brinster, & Halberda, 2013). Imagine a child trying to make sense of what a teacher is saying (e.g., *Can you find the rhombus?*) if he or she cannot rapidly infer the meaning of the new word *rhombus*, even though all the other shapes in the display are familiar ones. Children need to be able to learn new words on the fly and extend the syntax they already have to include the new words in novel sentences. All of the item types in the Process area require children to quickly infer the meaning of a new word. In the research literature, this is known as *fast mapping*. Generalizing the new name to a different object in the same category is referred to as *extension*.

- ❖ *Verb Learning:* This type measures whether children can guess the meaning of a new verb from how it is used in a sentence context. For example, the reader likely does not know the meaning of *Sally blorked John*. However, the reader can infer that it is likely something Sally did to John. Given a picture of Sally doing something new to John, versus a picture of Sally doing something that does not affect John, the reader could discern which picture matched the sentence.
- ❖ *Converting Active to Passive:* Verbs are converted from one grammatical structure (the active voice, e.g., *Sally blorked John*) to another (the passive voice: *John was blorked by Sally*) all the time. This type checks whether children comprehend both active and passive voices.
- ❖ *Noun Learning:* This type examines children’s ability to fast-map a novel noun to a novel object, such as when a child is told to “Pick up the spatula” on the floor when there is a fork, a spoon, and an unknown object in view (the spatula). If the child learned the word *spatula*, he or she should be able to extend that word to a second spatula in a different color. Children can generally do this before their third birthday (Golinkoff, Hirsh-Pasek, Bailey, & Wenger, 1992).
- ❖ *Adjective Learning:* This type examines children’s ability to quickly map a novel adjective to a novel characteristic of familiar objects and then extend that meaning to another object with the same property. If shown a table with an unusual pattern on its surface, can the child infer that the novel word *pinty* in the sentence *The table is pinty* likely refers to the table’s pattern? Research has shown that children begin to do this in their second year of life (e.g., Waxman & Klibanoff, 2000).



The Process types are interspersed throughout the screener among the Vocabulary and Syntax types to limit strategy carryover across types that are similar in format (e.g., Noun Learning and Adjective Learning) but require slightly different strategies for finding the correct answer. For example, in Noun Learning, children must choose a novel object that has certain characteristics (e.g., a blue *fep*), and in the extension trial (i.e., the second part of the item), they must choose another version of that object, even if one of its characteristics has changed (e.g., a green *fep*). In contrast, in Adjective Learning, children must pay attention to the pattern of one object and then recognize that pattern has been extended onto a different object. Thus, an unrelated type, Prepositions, is presented between Noun Learning and Adjective Learning so that children cannot develop a strategy in answering these questions.

Within each type, the items are presented from easiest to hardest, based on results from piloting and the item tryouts conducted during development of the QUILS. This item order was chosen to prevent children from becoming frustrated by a difficult item early on and potentially refusing to continue.

QUILS Components

The QUILS has two primary components—the web site and the User’s Manual. There is also a third component, the Language Questionnaire, that is used before a student is screened if there are any questions about a child’s familiarity with English. Each of these components is described below:

- ❖ *Web site:* The screener itself is on a web-based platform where subscribers can set up their accounts (including creating Student Records for each child to be screened), administer the QUILS from a touchscreen computer or tablet, and generate reports on screening results.
- ❖ *User’s Manual:* Available in PDF format on the QUILS web site as well as in print format, this User’s Manual is organized in three sections that describe what the QUILS is, how to give it, and the evidence base for its use.
- ❖ *Language Questionnaire:* This brief questionnaire completed by parents (see Figure 6.1) is used to determine children’s eligibility for the QUILS. For more information, see Chapter 6.

Web Site

The QUILS is a web-based instrument, rather than a traditional paper-and-pencil test that is hand-scored by an examiner. In a traditional paper-based test, the examiner (usually a trained and certified speech-language pathologist) must give oral instructions and present the stimuli in a standard manner, tally totals, and then compare the child’s performance to a printed table of norms in a manual or an online file to write a report of results. With the increasing availability of touchscreens on tablets and computers, the QUILS takes advantage of digital technology to screen children’s language quickly. This design offers numerous advantages for screening young children. It standardizes the way the items are given because the QUILS is administered automatically. It also immediately records the child’s screen presses and stores the data for later display in a number of different ways. This automated scoring and generation of reports based on those results saves time for the teacher or administrator and means clinical

judgment is not required to interpret the child’s answers. Perhaps most important, many children are familiar with touchscreens and enjoy taking the screener.

After a teacher or administrator sets up a Student Record in the QUILS software for the child (including the child’s name, age, and gender), the adult clicks the “Start Screening” button from the Student Record to start the QUILS for the child. The child listens to the items and proceeds through the screener, touching the screen of the device or clicking on a monitor to answer the items. The software presents the instructions, the narration for the stimuli, the pictures for the items, and short reinforcing animations between the types of items to encourage the child to stay on task. This design means that minimal guidance is needed for the child, and the adult who is supervising is able to do so without special training. After the child completes the screener, various reports can be generated comparing the child’s results to the norms for the child’s age group. Refer to Chapters 5 and 6 for more detail on the QUILS web site.

User’s Manual

The User’s Manual has three sections. The first section provides an overview of the conceptual development of the screener, reviews why it is needed, and explains how it was developed. The second section covers all aspects of the administration from setting up an account and Student Records to administering the screener and generating reports. It also includes case studies. The third section explains the evidence base for the QUILS and includes the psychometric data gathered during development.

Language Questionnaire

When the teacher is aware that the child has been exposed to a language other than English, the teacher should give the child’s parents the brief Language Questionnaire, which was adapted to accompany the screener to determine which version of the QUILS is most appropriate for the child.



The Language Questionnaire to accompany the QUILS helps to determine whether the child has had sufficient exposure to English if he or she comes from a language environment other than English. The decision to give the QUILS to a child should be conditioned on whether that child has learned enough English to be screened on his or her competencies in English or whether the child is still in the process of learning English and the screener would not be helpful.

If the screener is given to a child who does not yet know enough English, the child could be inappropriately identified as potentially having language problems when the child simply requires additional time to learn English. Children taking the QUILS should be well matched to the population sample used to develop the norms. Otherwise, comparisons of a child to the norms will be meaningless. For more information on using the Language Questionnaire, see Chapter 6. For children who come from Spanish-speaking backgrounds, there is another version of QUILS for English–Spanish speakers that is more appropriate.

English–Spanish Bilingual Version of the QUILS

A bilingual English–Spanish version of the QUILS is also available. The Quick Interactive Language Screener™, English–Spanish (QUILS™: ES) has two sections, one in English and one in Spanish. Each section includes the same 3 areas and 12 types contained

in the QUILS. None of the items in the English section of the QUILS: ES appear in the Spanish section. The two sections have no overlapping items to avoid children remembering the answers in one language and simply selecting those answers in the other language from recall.

During item development and creation, native Spanish-speaking experts evaluated each item, ensuring that the items 1) were feasible for both English-monolingual and Spanish–English bilingual children, and 2) did not discriminate between children who spoke different dialects of Spanish. All items were chosen to be adaptable to Spanish, rather than relying on simple translation, and only words that were neutral across Spanish dialects were considered for inclusion in the screener. In addition, the use of obvious cognates, or words that overlap in form and meaning across languages such as the English *piano* and Spanish *piano*, were avoided. This design prevents a speaker of Spanish from scoring correctly on an English item because of his or her Spanish knowledge rather than English knowledge of the word.

For more information about the QUILS: ES, refer to the copyright page.

2

Why the QUILS Is Needed

Language is the single best predictor of success in school. Cocking and Mestre (1988) called verbal skills the currency of education. Understanding teachers and peers, following narratives, telling stories, participating in conversation, learning to read, and learning to do math all rest on linguistic skill. Early language competence predicts not only communicative competence but also subsequent reading ability and overall academic performance (e.g., Catts et al., 2002; National Early Literacy Panel, 2009; NICHD ECCRN, 2005; Scarborough, 2001). Language skill is also associated with children's ability to control their behavior (Roben, Cole, & Armstrong, 2013).

Yet teachers in crowded classrooms can only identify the most egregious language problems. They need a quick and easy-to-administer language screener that can be used as an early warning signal for children at risk for language delays or disorders. Such a screener is essential as the education community strives to apply contemporary research and increase accountability.

Current Needs for Language Screening

Although science has accumulated a great deal of knowledge about the typical course of language development and the importance of language for children's overall functioning, there is a disconnect between basic research and the development of measurement tools. There is no quick and efficient language screener that is reliable, valid, and culturally neutral to fill the critical need for widespread, accurate preschool and kindergarten language screening.

From a curricular perspective, data from such an instrument can provide a basis for comparison among programs and a baseline to assess the effectiveness of instructional strategies designed to enhance later school success. Individual screening and assessment results can aid in identifying children and subpopulations with special needs who require supplemental instruction to strengthen specific competencies.

Because resources are in short supply and teachers generally lack the expertise to identify all but the most extreme cases, a brief, reliable, easily interpretable screener would make the job of identifying students who need a diagnostic work-up and possibly intervention easier. Tomblin and colleagues (1997) underscored this issue. In their rigorous epidemiological study involving more than 7,000 children, they estimated the prevalence of specific language impairment (SLI), or language impairment that cannot be attributed to other conditions such as hearing loss or other developmental disability. They calculated the prevalence of SLI among 5- to 6-year-old kindergartners at 7.4%. The more remarkable finding, however, was that 71% of the parents of these children had never been informed before that their children had language problems.

Paul (1996) described similar findings; only 34% of her school-age participants with expressive language delay had received any form of intervention during their preschool years. Failure to treat preschool language delay is unacceptable given that remedial training at the earliest stages of language development can reduce deficits that otherwise have a negative and cumulative impact on later development. These results also suggest that current federal laws in the United States mandating preschool services are not wholly effective for children with SLI.

The need for a language screener for use with preschool children is paramount. Proper instruction and intervention are likely to be more effective in younger children, and the effects of overlooked language delays snowball during the preschool years with long-term consequences. Research shows that by 3 years of age, children are already segregating according to verbal ability; for example, children with poor communication skills are less sought after as conversational partners and more likely to be ignored or excluded by their peers (Rice, 1993). These children then fall further behind socially and tend to develop poor self-esteem as they advance through childhood (e.g., Conti-Ramsden & Botting, 2004; Craig, 1993; Jerome, Fujiki, Brinton, & James, 2002; Lindsay & Dockrell, 2000). What is encouraging, though, is that even short-term gains in language ability can enhance social relationships and mitigate the negative impact of language delay on behavioral, social, and emotional development (Olswang, Rodriguez, & Timler, 1998; Paul, 1996; Robertson & Weismer, 1999).

Many states are instituting kindergarten entry assessments (KEAs) or kindergarten readiness assessments (KRAs) to inform teachers and parents about children's knowledge before they enter kindergarten (Build Initiative, 2017; <http://www.buildinitiative.org/TheIssues/EarlyLearning/StandardsAssessment/KEA.aspx>). Another purpose of KEAs is to screen for children who might have developmental delays as well as to allow comparisons between children across years to discover trends for policy purposes. A position paper by the Council of Chief State School Officers (2011) called *Moving Forward with Kindergarten Readiness Assessment Efforts* included "language and emergent literacy" (p. 3) among the child development domains that should be assessed. However, they also mentioned that "unfortunately, there are few assessment tools that capture contextual aspects of children's early learning and development, including their cultural background, linguistic diversity, and special needs" (p. 3).

Shortcomings of Other Language Assessments

Scholars have reached near consensus on 1) the language milestones that children should achieve regardless of native language background, and 2) the processes through which these milestones are acquired (Fenson et al., 1994; Hirsh-Pasek & Golinkoff, 1996, 1999). Early comprehensive oral language skills at age 3, measured as both vocabulary and syntax, contribute to reading outcomes in first grade regardless of socioeconomic status (SES; NICHD ECCRN, 2005). Likewise, vocabulary and grammar ability in prekindergarten are unique predictors of language variability in third grade (LARRC, 2015). Yet despite the research on the importance of language for school success, assessments for measuring language growth have failed to keep pace with current research that underscores the importance of evaluating the *processes* by which children learn language as well as the products of language learning. That is, we know a good deal now about how children utilize effective language learning strategies. Existing assessment tools generally measure observable achievements—products—rather than the processes that provide the underpinnings for continued language development. Another way to say this is that existing screeners

and assessments measure what the child *knows* with little attention to *how* the child learns (Kochanoff, Hirsh-Pasek, Newcombe, & Weinraub, 2003).

Traditional assessment strategies largely neglect whether children have the ability to rapidly learn new word meanings (fast mapping), to exploit the syntactic contexts in which new words appear, and to extend words in previously unattested contexts—all of which jointly contribute to children’s skills as language learners (Fisher, 1996; Golinkoff, Jacquet, Hirsh-Pasek, & Nandakumar, 1996; Seymour, Roeper, & de Villiers, 2004). This prevailing emphasis on assessing the product rather than the process of learning is unfortunate for several reasons. Product-oriented, knowledge-based assessments tend to be insensitive to cultural, linguistic, and socioeconomic differences. In the realm of language, such tests are typically geared toward children who have had considerable language experience (Hart & Risley, 1995), which is typically available in middle class homes where Standard American English is spoken. As a consequence, assessments of this sort fail to distinguish between children who experience language learning problems and those who are simply lagging behind because they have had insufficient or different exposure to language.

In the same vein, efforts to improve student performance on product-oriented, knowledge-based assessments may take the form of training to the test. To the extent that such training focuses on overlearning specific information rather than on strengthening learning strategies, it may inflate scores without imparting significant long-term benefits. Furthermore, differences in language experience, regardless of whether they derive from family background or intensive instruction, will serve to erode the predictive validity of product-oriented, knowledge-based language assessments.

There are many reasons children might be behind in early language competence, each with important implications for remedial strategies. For example, children may have fewer vocabulary words than their peers (product) due to limited exposure to language models but may be in line with their age group in terms of language processing skills (process) because they can fast-map a new word onto an object or action after one or two exposures. These children would benefit from a program that increases exposure to language. In contrast, children with processing difficulties may require interventions that introduce compensatory strategies. Profiling both standard language outcomes and the processes that contribute to language ability are necessary steps in the development of a screening tool that is culturally and linguistically fair, linguistically sensitive, and able to direct appropriate interventions.

In addition to these shortcomings in construction, current omnibus assessments of language are time-consuming and require trained professionals to administer and score. Omnibus assessments are not needed for every child; however, language is so crucial to children’s academic success and future well-being that schools should screen young children specifically for potential language problems. Given that schools typically have limited resources, a language screener must be quick, reliable, and based on developmental science.

What the QUILS Offers



The QUILS closes the gap between research and practice; it is built on converging evidence about the processes and products of language acquisition from birth through the preschool years. By using this dual product–process approach, the QUILS includes both observable milestones and underlying processes for more effective early language screening.

Unlike other assessments and screeners, the QUILS builds on the latest research in language acquisition from developmental science. It has empirical validity. Hirsh-Pasek, Kochanoff, Newcombe, and de Villiers (2005) wrote, “The perfect assessment would be one that was reliable, psychometrically valid, empirically valid, practical to administer and offered a holistic approach to child development. The test would also be easily administered by paraprofessionals, teachers or professionals” (p. 9). The QUILS meets these criteria.

The QUILS is a brief screener, so it addresses problems associated with existing language instruments. It allows teachers and paraprofessionals unfamiliar with language assessment to screen whole classrooms of young children quickly and efficiently to identify children who need further attention for possible language problems.



The QUILS also measures children’s language early, before reading is fully introduced. It identifies children’s individual strengths and weaknesses and allows for the introduction of appropriate enrichment and remediation. (Language—both vocabulary and syntax—is a key component for reading acquisition and reading comprehension, as both contribute to the ability to extract meaning from text.)

Screening with the QUILS will help prevent children with language delays from reaching kindergarten without their parents or teachers noticing any language concerns. The QUILS prevents children with language problems from languishing without remediation. Recall that Tomblin et al. (1997) reported that only 29% of parents of children diagnosed with SLI had been previously informed that their child had a speech or language problem.

Existing omnibus language tests are meant for clinical diagnosis and are time intensive, requiring an average of 45–60 minutes to administer. The QUILS is not designed to supplant more comprehensive assessments or screeners used by speech-language pathologists but can serve as a first step in ensuring that all children receive the assessment and instruction that they need.

Some assessments are culturally and linguistically biased (Hammer, Pennock-Roman, Rzasa, & Tomblin, 2002; Rhyner, Kelly, Brantley, & Krueger, 1999). Many require detailed instructions and highly qualified personnel for administration and interpretation of the results (Hresko, Reid, & Hammil, 1999; Semel, Wiig, & Secord, 1995; Zimmerman, Steiner, & Pond, 2002). Traditional test formats are also difficult to adapt for children who have short attention spans or are reluctant to engage with the assessor.



In contrast, the QUILS was designed with linguistic and cultural fairness in mind. The items of the QUILS were selected through careful testing to be culturally and dialectally neutral; they do not place children from a range of cultural backgrounds and children who speak dialects such as African American or Appalachian English at a disadvantage.

The QUILS accomplishes these design goals within a framework that avoids the demands of examiner preparation and specialized training. The screener is largely automated; therefore, its delivery and narration are uniform. The chore of scoring and generating reports is also automated. Most important, children do not need to be coaxed: they enjoy taking the screener!

3 How the QUILS Was Developed

The QUILS development process occurred in four main phases over 5 years: 1) Item Development, 2) First Item Tryout, 3) Second Item Tryout, and 4) Creation of the Final Version of the QUILS.

Item Development

Each QUILS item was developed based on research on children’s language development during the preschool years. To measure what preschoolers know about language, the QUILS development team created 12 types of items to test both vocabulary (e.g., knowledge of nouns) and syntax (e.g., the ability to answer *wh*-questions). These types were piloted individually in laboratory settings in the northeastern United States (at the University of Delaware, Smith College, and Temple University) to perfect the items prior to the First Item Tryout.

Three general principles guided Item Development:

1. To avoid cultural bias in the screener, words or linguistic structures not used in African American English, or other non-mainstream dialects, such as Southern White English, were avoided (Green, 2002, 2011; Oetting, Cleveland, & Cope, 2008; Seymour, Bland-Stewart, & Green, 1998). One team member, Jill de Villiers, had prior experience researching and writing about African American English and its assessment (de Villiers, de Villiers, & Roeper, 2011; de Villiers & Johnson, 2007; de Villiers, Roeper, Bland-Stewart, & Pearson, 2008; Johnson & de Villiers, 2009; Seymour, Roeper, & de Villiers, 2004). The team called on this research base to choose items that would not be biased for speakers of that dialect.
2. The development team chose items that could be easily represented using either static or dynamic visual displays. Prior research indicated that young children have difficulty interpreting statically represented action events (Cocking & McHale, 1981; Friedman & Stevenson, 1975). Therefore, some items required only illustration, whereas others required animation.
3. Because the QUILS: ES was developed at the same time as the monolingual English version, the development team chose items that were equally significant in the acquisition of English and Spanish. This meant that the type of items selected was not unique to one of the languages but suitable for assessment in both. For example, *wh*-questions take a similar form in both languages, so they were suitable items. In contrast, Spanish has a very different form of possessive

from English, which makes such items hard to compare. Aquiles Iglesias was essential in this regard as a researcher who has focused on bilingual language development (Iglesias & Rojas, 2011, 2012; Miller & Iglesias, 2012). He is also a bilingual speaker of English and Spanish and provided guidance in avoiding items that would be problematic in the development of the QUILS: ES. (For more information, see www.quilscreener.com.)

Pilot testing during item development was extremely informative about which items children understood and which appeared to scale by age. Those items that proved too easy or difficult or did not show suitable improvement with age were removed and alternatives were tested in their place.

Laureate Learning Systems (Mary Sweig Wilson, one of the creators of the screener, is Laureate's President and CEO) produced many of the auditory stimuli, pictures, and animations for the pilot tests. The items used in pilot testing were a mix of existing Laureate items and those created by the labs.

First Item Tryout

Once the items had been created and piloted individually in laboratory settings, the development team used all items that withstood their scrutiny during the First Item Tryout. A Field Testing Guide was developed so that the three main labs (Delaware, Massachusetts, and Pennsylvania), as well as other sites that assisted, could have a document that suggested best practices for administration of the screener. (For additional information on the sites, refer to Chapter 9.) Some of the chapters in this User's Manual represent a revision of that document.

Pilot testing was completed prior to First Item Tryout. Some of the items used in pilot testing were developed by Laureate artists. Only items created in the labs were redrawn by Laureate artists. A male speaker at Laureate with a regionally neutral American accent and prior experience producing voiceovers recorded the auditory narrations for the items. Following conventional evidence-based practice in psychometrics, the development team tried out twice the number of items to appear in the final screener (Schmeiser & Welch, 2006). Anticipating that the final screener would contain 48 items (approximately half vocabulary and half syntax), the First Item Tryout was a 96-item test, with 48 items that tapped syntax (product and process) and 48 items that tapped vocabulary (product and process). The First Item Tryout was conducted with 306 monolingual English-speaking preschoolers from diverse socioeconomic backgrounds in Massachusetts, Delaware, and Pennsylvania. The sample consisted of 93 three-year-olds, 118 four-year-olds, and 95 five-year-olds.

The order of presentation of the three areas and types was determined during the development process as a result of the First Item Tryout. Because the test included 96 items, they were administered in two separate sessions counterbalanced across participants: 1) Vocabulary types (Nouns, Verbs, Prepositions, and Conjunctions) with embedded vocabulary-related Process types (Noun Learning and Adjective Learning); and 2) Syntax types (*Wh*-Questions, Past Tense, Prepositional Phrases, and Embedded Clauses) with embedded syntax-related Process types (Verb Learning and Converting Active to Passive). Data from the First Item Tryout were used to examine test-order effects on children's performance. Boys who received vocabulary first did worse overall than girls who received vocabulary first, but presenting the syntax component first did not lead to a gender difference. Hence, this latter order was adopted for the Second Item Tryout and the final QUILS.

To proceed with Second Item Tryout, Rasch and differential item functioning (DIF) analyses were conducted to identify the best 60 items out of the 96 tested as well as to remove redundancy so that items yielded different data patterns. Rasch analysis assesses whether items are appropriate or redundant and has become a well-respected procedure for test development (Bond & Fox, 2001; Linacre, 2006). DIF analyses are useful for detecting whether items are biased against one or another group (e.g., gender) receiving the test. The 60 items scaled with age such that on all items 5-year-olds showed highest performance and 3-year-olds showed lowest. For additional information, refer to Chapter 9.

Second Item Tryout

After the First Item Tryout was complete and analyzed to select the best and least redundant items, this final set of 60 items was made uniform in appearance before Second Item Tryout. The development team administered the 60-item version of the screener to the final normative sample from preschools, kindergartens, and Head Start programs in Massachusetts, Pennsylvania, Delaware, Florida, and Nebraska. The normative sample was a subsample of 415 children stratified by SES and gender. (For more information, see Chapter 9, Table 9.1.)

During this phase, construct validity, convergent validity, and test–retest reliability of the QUILS were all evaluated. The evaluation of convergent validity used two widely used language tests: The Auditory Comprehension subtest of the Preschool Language Scales–Fifth Edition (PLS-5; Zimmerman, Steiner, & Pond, 2011) and Form A of the Peabody Picture Vocabulary Test–Fourth Edition (PPVT-4; Dunn & Dunn, 2007). Test–retest reliability of the QUILS was assessed by administering the screener a second time to a subset of children. (For details of these studies and results, see Chapter 9.)

Creation of the Final Version of the QUILS

After completion of the Second Item Tryout, the development team removed problematic items following similar Rasch and DIF analyses as in the First Item Tryout (see Chapter 9). The final QUILS consists of the best 48 items culled from two rounds of testing. These items have appropriate discriminative power across the range of abilities in the sample, which is especially important in the lowest performing group of children. The item set is also unbiased with respect to gender.



Administration of the QUILS

4 The QUILS Areas, Types, and Items

This chapter briefly describes and justifies the major parts of the QUILS. In other words, it explains why the QUILS development team chose these particular types of items from the vast arena of research on language development. The development team included experts from a variety of backgrounds: child development, linguistics, language assessment, and language intervention. The team chose the linguistic features that develop between the ages of 3 and 6 years. Other criteria included the ease of translating a feature into a format that could be assessed with pointing or touching, the neutrality of the feature with respect to dialect variants of English, and its relevance to the particular language demands children face in school. The team considered, “What is useful to a child as he or she embarks on schooling such that a shortfall would disadvantage the child compared to peers?”

Finally, the development team considered whether there was empirical evidence that children who had verified language difficulties tended to show problems in this area of language. The team particularly attended to specific language impairment (SLI) because that category includes children who do not otherwise have cognitive, hearing, or social difficulties (Rice, 2013). Although controversy can be found in the literature about whether this group is a genuinely distinct category (Rice, 2013; Tomblin et al., 2015), the

Table 4.1. Types of items listed in order of presentation

Type	Area	Number of items
Practice items	N/A	3
<i>Wh</i> -Questions	Syntax	5
Past Tense	Syntax	4
Verb Learning	Process	4
Prepositional Phrases	Syntax	3
Converting Active to Passive	Process	2
Embedded Clauses	Syntax	4
Nouns	Vocabulary	3
Verbs	Vocabulary	5
Noun Learning	Process	5
Prepositions	Vocabulary	5
Adjective Learning	Process	5
Conjunctions	Vocabulary	3
Total Vocabulary items		16
Total Syntax items		16
Total Process items		16
Total items on the screener		48

fact is that these children are more likely to be missed by medical practitioners, teachers, and lay individuals (Tomblin et al., 1997). Cognitive delays and social impairments are noticed more readily in a student than are language problems. The average parent—and even the average preschool teacher—will notice articulation errors and severe hearing difficulties but will not know at what age a child should use the passive voice or abstract words appropriately. The QUILS was designed to meet that need.

The QUILS has three areas: Vocabulary, Syntax, and Process. The first two capture what children already know about language when they take the screener (i.e., the products of their past language learning). Process taps into children’s ability to readily learn new language items by presenting them with novel words and sentence structures on the spot. These areas are broken down into types, which contain the individual items of the QUILS. The structure and sequence of presentation within the screener are shown in Table 4.1.

Vocabulary Area



The Vocabulary area consists of four types of items (Nouns, Verbs, Prepositions, and Conjunctions) that reflect words to which children ages 3 through 5 should have been exposed (see Table 4.2).

Table 4.2. Vocabulary types and items overview

Type	Item
Nouns	Find the fireworks. Find the sailor. Find the doorknob.
Verbs	Who is unlocking something? Who is returning? Who is leaning? Who is lugging something? Who is weighing apples?
Prepositions	Show me the doll is above the present. Find the ball is behind the pail. Show me the apples are in front of the bowls. Find the firefighters are between the chairs. Find the umbrella is below the swing.
Conjunctions	Who ate the food before the cat jumped on the table? Who came down the slide after the school bus arrived? Who picked up the cake because the baby ate it?

Nouns

Nouns refer to people, places, things, or ideas. Young children’s vocabularies generally contain a large number of nouns, particularly concrete nouns whose referents are tangible to the senses (e.g., ball) (Fenson et al., 1994; Gentner & Boroditsky, 2001). The noun vocabularies of typically developing children expand rapidly during the first 2 years and beyond and provide a foundation for learning other word classes (Gleitman, Cassidy, Nappa, Papafragou, & Trueswell, 2005). In contrast, research has shown, for example, that children with SLI have smaller noun vocabularies than their peers prior to age 3, and this difference persists throughout childhood, adolescence, and young adulthood (Rice & Hoffman, 2015).

Sample Item A target noun is presented with three foils—meaning four picture choices in all—on the screen. The narration instructs children to “Find the [noun],” and children then touch the screen to select their answer. There are three Noun items in the QUILS, one of which is shown in Figure 4.1.



Figure 4.1. Noun Item 23. “Find the fireworks.”

Verbs

Verbs refer to actions and states—such as *jump* and *believe*—and form the main part of the predicate of a sentence (Golinkoff & Hirsh-Pasek, 2006). Although in many languages verbs tend to enter young children’s lexicons later than nouns, typically developing children nonetheless comprehend many verbs by the second year (Bornstein, Hahn, & Haynes, 2004). Similar to nouns, imageability, or the ability to readily generate a visual image of a word’s meaning, is an important factor determining the age of acquisition of verbs (Ma, Golinkoff, Hirsh-Pasek, McDonough, & Tardif, 2009), and verbs referring to visible actions (e.g., *jump*) are generally learned prior to those referring to more abstract, invisible processes (e.g., *know*). Children with SLI exhibit deficits in verb knowledge relative to age-matched peers that are even more marked than their deficits in noun knowledge (Andreu, Sanz-Torrent, & Guardia-Olmos, 2012; Sheng & McGregor, 2010). This relative verb deficit may be attributed to the difficulty these children have using syntactic information to learn words (Johnson & de Villiers, 2009).

Sample Item Children view three static events on the screen, including the target and two foils. The narration prompts children to choose the response that answers the question, “Who is [verb]ing” or “Who is [verb]ing [something]” for each item. The QUILS has five Verb items, one of which is shown in Figure 4.2.

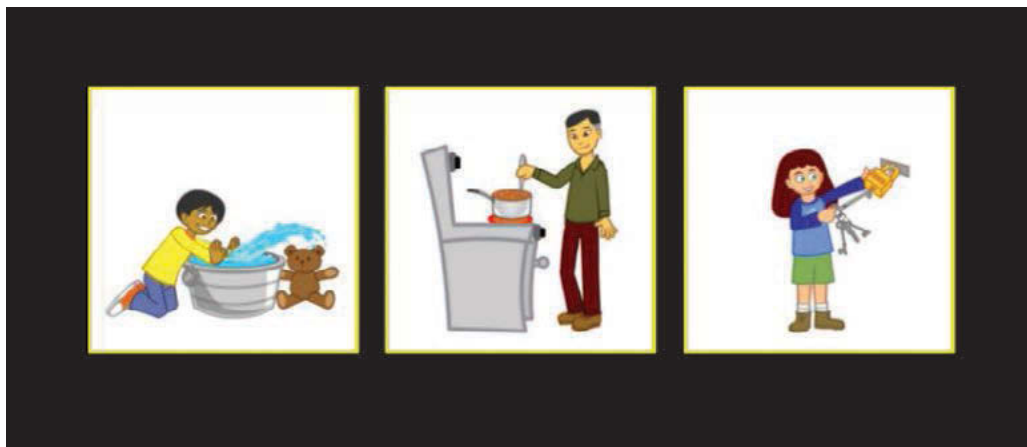


Figure 4.2. Verb Item 26. “Who is unlocking something?”

Prepositions

Prepositions capture relations between other words in a clause, as in *The apples are in front of the bowls*. Children’s knowledge of prepositions lags somewhat behind their knowledge of verbs, but by age 3 typically developing children can both comprehend and produce a number of spatial prepositions (Schlosser et al., 2012). Research has documented the developmental acquisition of prepositions, indicating that some (e.g., *under*) are acquired earlier than others (e.g., *between*) (Clark, 2009). Researchers have also found that children with SLI often erroneously omit prepositions from sentences and experience delays in their comprehension of these terms (Grela, Rashiti, & Soares, 2004; Puglisi, Befi-Lopes, & Takiuchi, 2005).

Sample Item Children are presented with three options depicting objects in different relational configurations (e.g., apples *in front of* bowls, apples *between* bowls, apples *behind* bowls) and are asked to identify the requested relation (e.g., “Show me the apples are *in front of* the bowls”). The QUILS contains five Preposition items, one of which is shown in Figure 4.3.

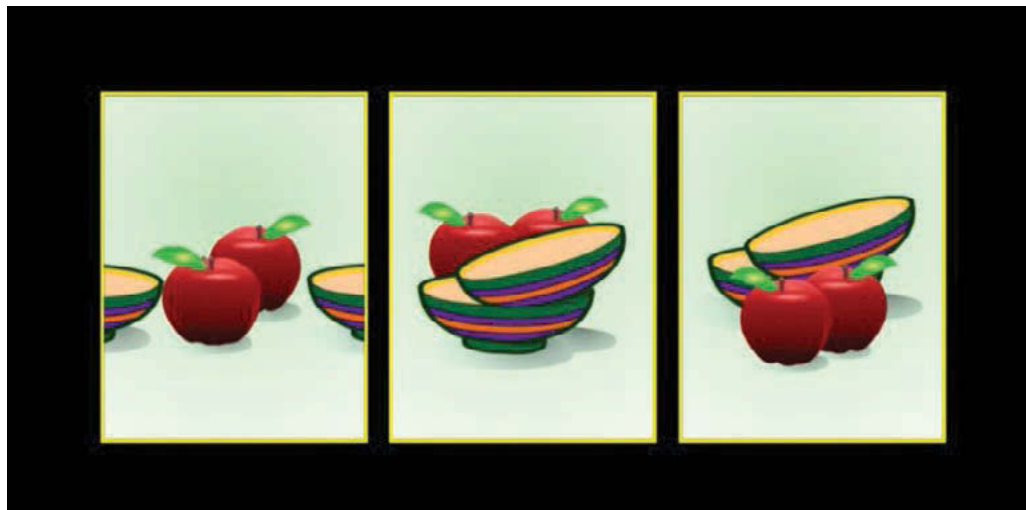


Figure 4.3. Preposition Item 38. “Show me the apples are in front of the bowls.”

Conjunctions

Conjunctions are terms that connect clauses by expressing temporal (e.g., *before*) or causal (e.g., *because*) relationships, as in *The woman painted before the baby cried*. These words “give us the linguistic freedom to express a series of events (real or imaginary) in any order” (Munte, Schiltz, & Kutas, 1998, p. 71). Children begin to use conjunctions around 3–4 years (Fenson et al., 1994; Weist, 1989), but comprehension of these terms, independent of particular familiar contexts, continues to develop between ages 3 and 5 and beyond (Clark, 1971; Winskel, 2003). There is a typical acquisition pattern, with *before* and *after* acquired prior to *while*, which is acquired prior to *since* (Winskel, 2003). Similar to prepositions, children with SLI omit conjunctions more than their age-matched peers (Gonzalez, Cáceres, Bento-Gaz, & Befi-Lopes, 2012).

Sample Item A dynamic event first appears on the screen depicting two different actors (e.g., a boy and a girl) who will perform the same target action (e.g., sliding down slides). An additional event then occurs with a different time relationship to each of the character’s actions (e.g., the school bus arrives after the boy slides down the slide but before the girl slides). Once the sequential display is completed, the scene freezes on the last frame to eliminate children’s need to retain the information in memory. The scene becomes smaller, and three choices appear under the scene. Children hear a question about the relationship between the events they have just seen (e.g., “Who came down the slide *after* the school bus arrived?”). Correct interpretation of the conjunction (e.g., *after*) is necessary to determine the actor to which the question refers (i.e., the girl). Children must select the target box they think best answers the question from three options (e.g., the bus, the boy, or the girl). There are three Conjunctions items in the QUILS, one of which is shown in Figure 4.4.

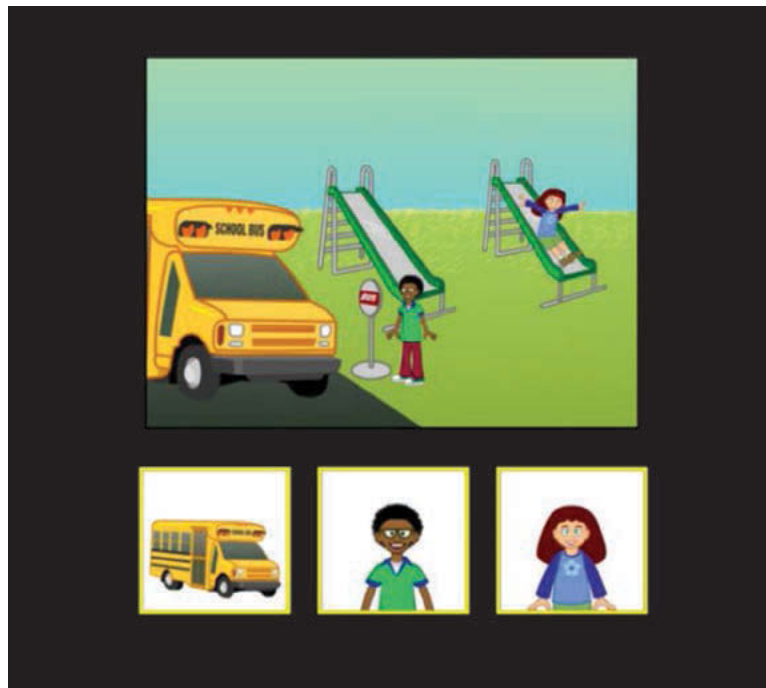


Figure 4.4. Conjunction Item 47. “Who came down the slide after the school bus arrived?”

Syntax Area



The Syntax area screens children’s existing syntactic knowledge—knowledge of the structure of a language and, specifically, the components of grammar that govern the ordering of words in sentences. The Syntax area of the QUILS contains types that probe children’s knowledge of *Wh*-Questions, Past Tense, Prepositional Phrases, and Embedded Clauses (see Table 4.3).

Table 4.3. Syntax types and items overview

Type	Item
Wh-Questions	What is falling on the little girl?
	Who is kissing the baby?
	How is the boy filling the washtub?
	How is the baker roasting marshmallows?
	Why is the girl scattering corn?
Past Tense	Where was the boy raking the leaves?
	Where was the hat?
	Where was the girl painting the fence?
	Where was the wheel?
Prepositional Phrases	Find the dog behind a black table.
	Find the kitten in a cup with yellow ribbon.
	Find the girl behind a car in a white garage.
Embedded Clauses	Where did Grandma tell Jack to go?
	What did Cowboy Bob tell Mia to do?
	Where did Hannah tell Little Matt that Jack was?
	Where did Grandpa tell Grandma that Mia was?

Wh-Questions

Wh-questions, which begin with *who*, *where*, *what*, *why*, *when*, and *how*, are used pragmatically to ask for information. Research shows a typical developmental sequence for *wh*-question acquisition: *what*, *where*, and *who* are generally learned prior to *why*, *when*, and *how* (Bloom, Merkin, & Wootten, 1982; Rowland, Pine, Lieven, & Theakston, 2003). Several reasons for this sequence have been documented in the literature, such as the semantic complexity of the verbs with which each *wh*-word typically occurs (Bloom et al., 1982) and the frequency with which each *wh*-question appears in caregiver speech (Rowland et al., 2003). An additional key explanation is the syntactic function of the *wh*-word. *What*, *where*, and *who* questions ask for the key sentence components that they replace and therefore serve relatively simple grammatical functions; *why*, *when*, and *how* serve more complex functions, asking for information concerning semantic relations among a sentence's components (Bloom et al., 1982; de Villiers et al., 2008). Children with SLI exhibit poor comprehension and production of some *wh*-questions because they have difficulty with complex syntactic structures (Marinis & van der Lely, 2007) and with retaining the *wh*-word in memory before the question can be interpreted (de Villiers et al., 2008; Deevy & Leonard, 2004).

Sample Item Children are presented with an illustration depicting an event. They are asked a *wh*-question about a particular aspect of the event. Children then select their response from three pictured options, all of which refer to different parts of the scene. The QUILS contains five *Wh*-Question items, one of which is shown in Figure 4.5.



Figure 4.5. Wh-Question Item 3. “How is the boy filling the washtub?”

Past Tense

Morphology refers to the structure of words, as words are often composed of parts with meaning. For example, a word such as *opened* contains the verb *open* and an extra *morpheme* (a piece that carries meaning), namely, the past tense *-ed*. Past tense morphology is used to refer to past actions, states, and locations. Tense knowledge is an important aspect of children’s grammatical development because it enables children to understand and discuss *when* an event occurred (Wagner, 2001). Tense morphemes appear fleetingly in children’s speech by approximately 24 months (Radford, 1990; Valian, 1991, 1992; Valian & Aubry, 2005). Morphosyntactic learning is gradual (Rispoli, Hadley, & Holt, 2012). Comprehension, in tandem with production, shows substantial advancements between ages 2 and 4 (Valian, 2006). For children at risk for SLI, however, tense marking develops at a slower and more protracted rate relative to their peers with low vocabulary who are not at risk for a developmental disorder (Hadley & Holt, 2006). Research supports the absence of tense as a possible diagnostic marker of SLI (Gladfelter & Leonard, 2013; Rice, 2003; Rice & Wexler, 1996). The past tense *-ed* is frequently not required in African American English, however, making it potentially a biased test item for children who speak that variety (Seymour et al., 1998; Pruitt & Oetting, 2009). For that reason, the QUILS evaluates only the *be* copula verb

(“Where was the wheel?”) and auxiliary verb (“Where was she painting the fence?”) forms in the past (*was*) because they are obligatory in both mainstream English and African American English (Seymour et al., 2004).

Sample Item The child is asked about where something was or where an action happened earlier, across two successive scenes. Immediately following the first scene, the next static scene shows that the person completed the action in the first location and began performing it in a new area. In other cases, something happened to the original highlighted (flashing) object from the first scene and it moved to a new location (e.g., the hat in Figure 4.6). The child is asked to indicate where the action took place or where the object was previously located from three options: the new location of the action or object, the previous location, or an entirely different location. There are four Past Tense items using *was* on the QUILS.



Figure 4.6. Past Tense Item 7. “Look at this hat. Uh oh, it blew off! Where was the hat?”

Prepositional Phrases

A prepositional phrase describes an object or action using one or more modifiers, as in *a cat in a cup with a yellow ribbon*. Children must not only understand the semantics of the prepositions and adjectives but must also recognize the importance of order information in the phrase. For example, order information is necessary to distinguish *a cat in a cup with a yellow ribbon* from *a cat with a yellow ribbon in a cup*. The developmental complexity of prepositional phrases used and comprehended increases during the preschool years (Landau & Stecker, 1990; Trueswell, Sekerina, Hill, & Logrip, 1999). Children with SLI typically continue to have difficulty forming and understanding prepositional phrases, particularly phrases that are syntactically complex and less frequent in the speech children hear (Puglisi et al., 2005; van der Lely, 1998).

Sample Item Children hear a sentence describing a particular spatial relationship between particular items and then are shown three options from which to choose: the target, a foil that presents an incorrect relationship between the objects, and a foil that applies the adjective to the wrong object but correctly depicts the spatial relation between the objects. There are three Prepositional Phrases items in the QUILS, one of which is shown in Figure 4.7.

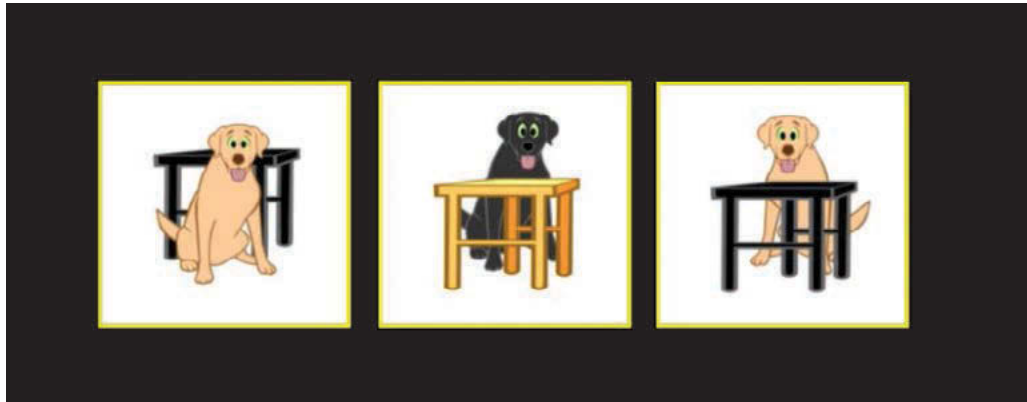


Figure 4.7. Prepositional Phrase Item 14. “Find the dog behind a black table.”

Embedded Clauses

An embedded clause is a clause (i.e., subject and verb) that is located within a main clause and which alters the meaning of the sentence. Embedded clauses play a critical role in expressing theory of mind—the understanding that other people have beliefs, knowledge, emotions, or intentions that may differ from one’s own (de Villiers, 2005, 2007; de Villiers & de Villiers, 2003; de Villiers & Pyers, 2002). For example, the sentence *Sofia told Mauricio that Javier was in the garage* does not express where Javier *actually* is but only where Sofia told Mauricio that Javier is. Comprehension of this distinction in these complex grammatical structures shows continued advancement between ages 4 and 9 in typically developing children. Children with SLI, however, show significantly more errors than their peers at all ages tested, with 25% of 6- and 7-year-olds failing to take the embedded clause into account in their responses (de Villiers et al., 2011).

Sample Item A dynamic scene is presented with narration explaining one character’s expectations or thoughts about a second character in the scene (e.g., “Grandma told Jack to go to his room and do his homework”). However, in two examples, the second character does not comply with the first’s expectations (e.g., Jack is seen walking into the house, hanging out, and eating an apple, accompanied by the narration, “But really, Jack is in the living room eating an apple”). The narration then prompts children to recognize the competing interests of the characters and answer a related question (e.g., “Where did Grandma tell Jack to go?”). In two other examples, the character mistakenly reports what another character is doing or where that character is. In all cases, children must take into account the verbs in both clauses of the question (e.g., *tell* and *go*) and show an understanding of how the first clause alters the meaning of the sentence. Children are presented with four options: the target (i.e., Jack’s room), the actual location (i.e., the living room), and two additional items from the scene (i.e., footstool and television). There are four Embedded Clauses items in the QUILS, one of which is shown in Figure 4.8.

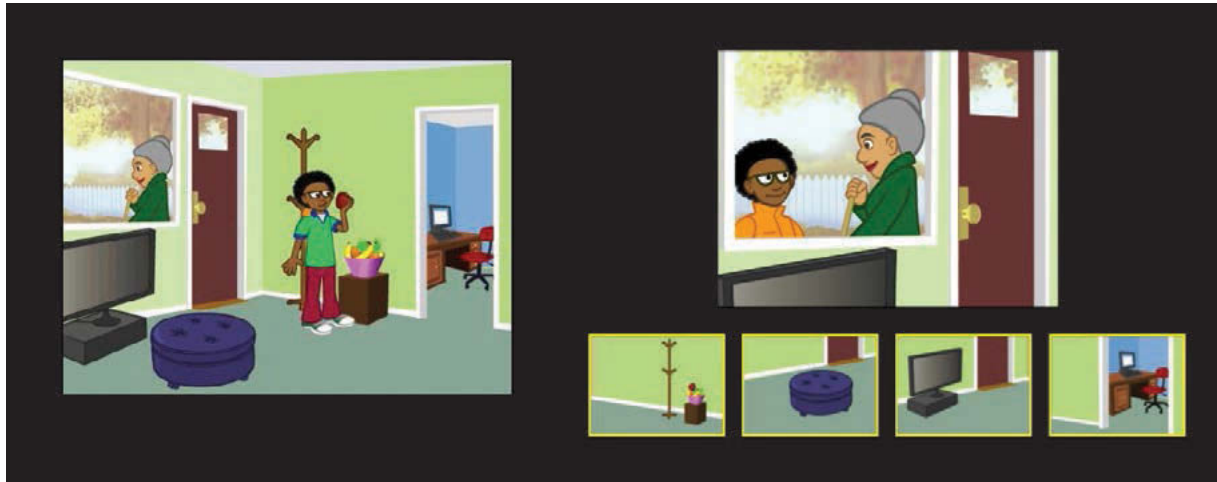


Figure 4.8. Embedded Clause Item 19. “Grandma told Jack to go to his room and do his homework. But really, Jack is in the living room eating an apple. Where did Grandma tell Jack to go?”

Process Area



The Process area emphasizes how the child acquires and applies new knowledge. That is, the QUILS introduces the child to a new language element and determines if the child can grasp it and extend or generalize it to a new scene. The Process area consists of four types of items (Verb Learning, Converting Active to Passive, Noun Learning, and Adjective Learning) (see Table 4.4).

Table 4.4. Process types and items overview

Type	Item
Verb Learning	Find the boy is meeing. Find someone is rulking something to someone. Find someone is jayming something to someone. Find someone is praving something.
Converting Active to Passive	Which one got lummed? Which one got koobed?
Noun Learning	Show me the blue fep. Can you show me another fep? Show me the pluff on the table. Can you show me another pluff? Show me the merf. Can you show me another merf? Show me the taff. Can you show me another taff? Show me the gelp with the hat. Can you show me another gelp?

(continued)

Type	Item
Adjective Learning	What else is zavish? Show me what else is zavish.
	What else is mezzish? Show me what else is mezzish.
	What else is gilpish? Show me what else is gilpish.
	What else is veamish? Show me what else is veamish.
	What else is bluggish? Show me what else is bluggish.

Verb Learning

The Verb Learning type measures children’s ability to quickly infer the meaning of a novel verb from the argument structure of the sentence, a skill referred to as *syntactic bootstrapping* (Fisher, 1996; Gleitman et al., 2005; Naigles, 1990, 1996). For example, some verbs require only a single noun, such as in the example, “*Jim sneezed.*” Others, like *caught*, require two, such as “*Jim caught the ball.*” Typically, these verbs denote some kind of causal action in which one thing affects the other. Verbs that involve transfer require three nouns: “*Jim gave the car to his uncle.*” Because child-directed speech primarily consists of words in sentential contexts rather than words in isolation (Bernstein-Ratner & Rooney, 2001; Fernald & Morikawa, 1993), syntactic cues are extremely abundant in language input. Children begin to utilize syntactic cues for verb learning by age 2 (Gertner, Fisher, & Eisengart, 2006; Naigles, 1990, 1996) and gradually rely more on this information as they gain linguistic knowledge (Golinkoff & Hirsh-Pasek, 1996). Children with SLI, however, have poorer syntactic bootstrapping skills than their typically developing peers (Eyer et al., 2002). Moreover, Johnson and de Villiers (2009) demonstrated that individual differences in the ability to map verbs using syntax can be used to identify children with SLI or other language difficulties.

Sample Item Children view a dynamic event with one or two characters engaged in a novel action. In some cases, an additional character is performing a separate action. The narration describes the novel action using a novel verb. For example, “Someone is *rulking* something to someone.” In this example, the structure suggests a verb meaning some kind of transfer is taking place. The dynamic event then freezes and becomes smaller on the screen. Three options appear: the target action being performed by two novel characters, a novel action being performed by the two people who were previously performing the target action, and a second foil that shows the single character from the dynamic scene repeating his same action next to a second character standing still. Children are asked to choose the labeled target action from these three options. (“Can you find another one? Find someone is *rulking* something to someone.”) This is a stringent test of syntactic bootstrapping, or fast mapping of verbs, and extension. To correctly answer this item, children must first infer which action the novel verb referred to from the grammatical structure of the sentence and then extend this verb to another instance of the action with different actors. The QUILS contains four Verb Learning items, one of which is shown in Figure 4.9.

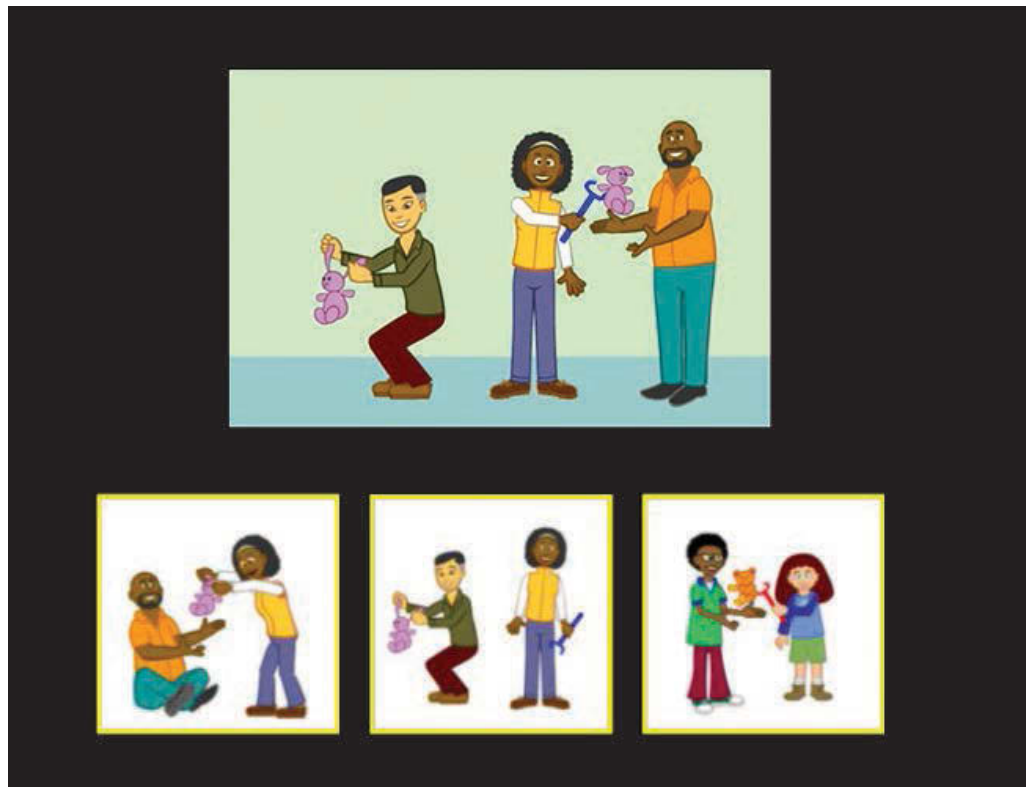


Figure 4.9. Verb Learning Item 11. “Someone is rulking something to someone. Hey! Someone is rulking something to someone! Find someone is rulking something to someone.”

Converting Active to Passive

Converting active verbs (e.g., *The girl is moving the cup*) to their passive counterparts (e.g., *The cup was moved by the girl*) requires a complex syntactic transformation. Given the complexity of passive relative to active sentences, it is no surprise that children comprehend and produce passive sentences significantly later than active ones (Baldie, 1976; de Villiers & de Villiers, 1973).

Not all passives are equally difficult, however. Children understand passives with action verbs (e.g., *kissed, chased*) before those with stative and mental state verbs (e.g., *stored, liked*) (Gordon & Chafetz, 1990; Hartshorne, Pogue, & Snedeker, 2015; Maratsos, Fox, Becker, & Chalkley, 1985; Pinker, Lebeaux, & Frost, 1987). Even typically developing children do not achieve greater than 95% accuracy for action verb passives until age 9 (Maratsos et al., 1985). Children with SLI show an even greater delay in learning passives (Marshall, Marinis, & van der Lely, 2007; Riches, 2015; van der Lely & Dewart, 1986).

Sample Item Children view a dynamic scene involving three actors: one is performing an action on a second actor while the third remains stationary. Children are prompted, “Hey, the woman is *lumming* the man!” Next, the scene freezes and shrinks, three picture choices appear, and children are asked, “Which one got *lummed*?” They are presented with three options: the woman and man involved in the action as well as the third, stationary actor. To answer this item, children must convert the active form of the verb *lumming* to the passive *lummed* in order to identify which person was being *lummed*. The QUILS contains two Converting Active to Passive items, one of which is shown in Figure 4.10.

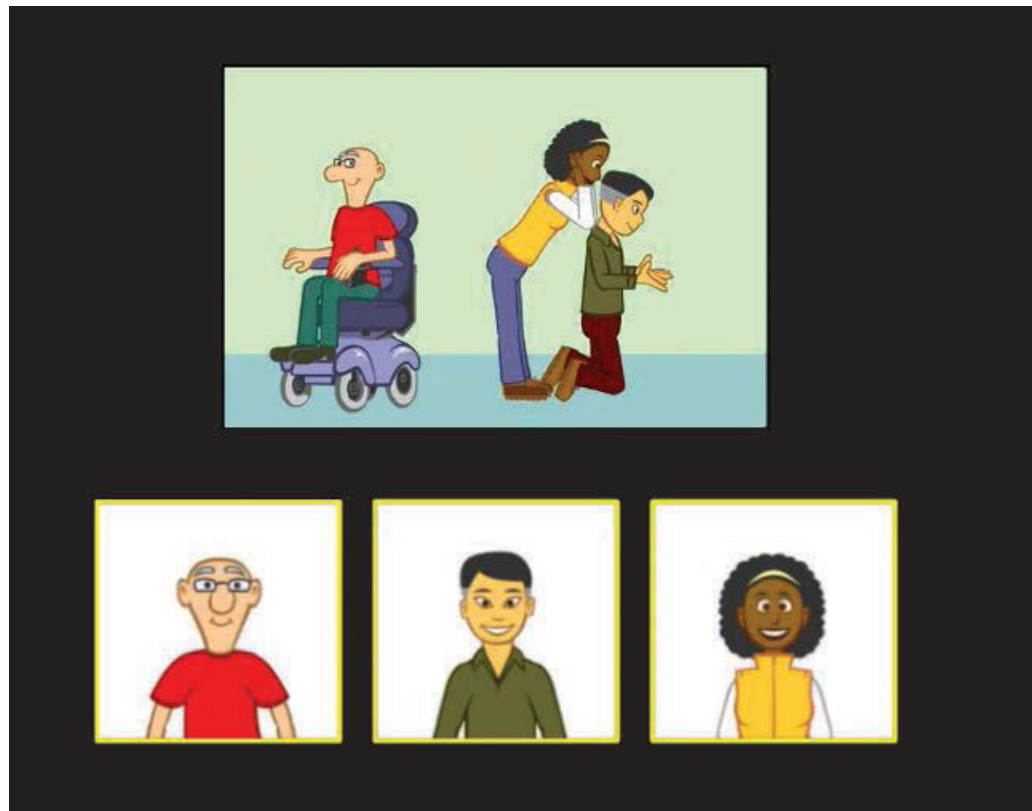


Figure 4.10. Converting Active to Passive Item 17. “The woman is lumming the man. Look, the woman is lumming the man! Which one got lummed?”

Noun Learning

The processes involved in learning new nouns, particularly concrete nouns that label objects, have been examined extensively (for reviews, see Golinkoff, Mervis, & Hirsh-Pasek, 1994; Swingley, 2010). The initial steps to learning a new noun are 1) *fast mapping* (Carey & Bartlett, 1978) a novel sound unit (e.g., *cow*) onto an object (e.g., a specific cow, present when the label is produced), and 2) *extending* (Markman & Hutchinson, 1984; Golinkoff, Shuff-Bailey, Olguin, & Ruan, 1995) the label to other members of the same basic category (e.g., other cows). Fast mapping involves making a snap decision about word meaning based on whatever information is available at the time the novel noun is introduced; this includes semantic cues, as in “A *gelp* is wearing a hat,” but also involves using the principle of mutual exclusivity (Markman, 1989, 1992; Merriman, Bowman, & MacWhinney, 1989) to eliminate alternative objects in the general vicinity that already have known labels (e.g., a dog). Extension requires children to use the *categorical scope* or the *taxonomic principle* (Golinkoff et al., 1994; Markman & Hutchinson, 1984) to generalize a label to other items in the same category. Of course, “words” formed from fast mapping and extension represent only partial knowledge. Their meanings must be filled in with additional specific information acquired over time (Bion, Borovsky, & Fernald, 2013; Yurovsky, Fricker, Yu, & Smith, 2014) if they are to be retained in the long-term (Horst & Samuelson, 2008; Wojcik, 2013). The initial inferential processes of fast mapping and extension are critical components of lexical acquisition (Zosh et al., 2013).

These coupled processes develop with language experience and are utilized more effectively by children with larger vocabularies (Bion et al., 2013; Ma, Golinkoff, Houston, & Hirsh-Pasek, 2011; Mervis & Bertrand, 1994). Children with SLI have difficulty fast mapping and require significantly more exposure to novel words than typically developing children do (Gray, 2004; Rice, Buhr, & Nemeth, 1990; Rice, Buhr, & Oetting, 1992). Given the significance of fast mapping for typical vocabulary growth and as a potential indicator of SLI, it is vital to assess children’s ability to use this strategy. If a child has difficulty fast mapping, repeated exposure to new words can help the child master this language learning process (Gray, 2004).

Sample Item Items have two trials, and children must get both items correct to be awarded credit. In the first trial, children are presented with a novel noun via narration (e.g., “A *gelp* is wearing a hat”) and view four objects on the screen: two that are known nouns but fit the semantic description (e.g., a dog wearing a hat), one that is novel but does not fit the description (i.e., a novel object with no hat), and the target, that is, one that is novel and meets the description (i.e., a novel creature wearing a hat). Children are asked to choose the image that best matches the novel label. Immediately following this first trial, a second trial asks children to find another instance of the same item (e.g., “Can you show me another *gelp*?”). They are presented with a new array of four objects: one known noun that fits the original description (i.e., a pig wearing a hat), one known noun that does not (i.e., a horse), one novel object (i.e., a novel creature), and a novel exemplar of the object labeled in the first trial (i.e., a *gelp* creature without a hat and with different coloring). The QUILS contains five Noun Learning items, one of which is shown in Figure 4.11.

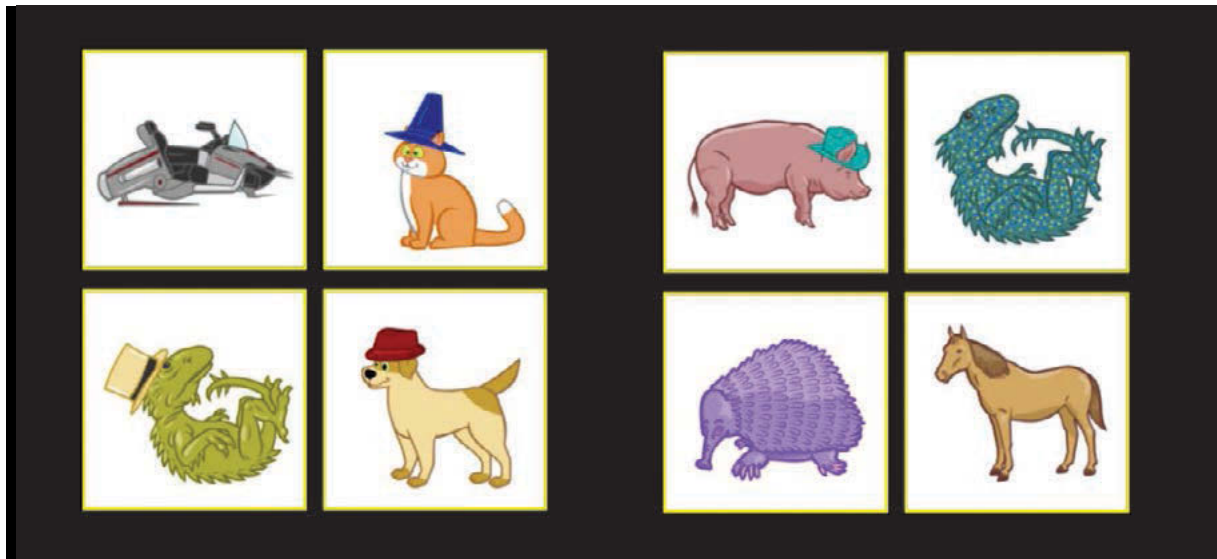


Figure 4.11. Noun Learning Item 35. Part 1 (Fast mapping): “A *gelp* is wearing a hat. Show me the *gelp* with the hat.” Part 2 (Extension): “Can you show me another *gelp*?”

Adjective Learning

To learn new adjectives, children must recognize that a novel descriptor is being used to highlight a feature of one item amongst other items (e.g., Waxman & Klibanoff, 2000).

Children generally learn to link novel adjectives to object features only after having a name for the object itself (Gelman & Markman, 1985). In addition, children experience developmental gains across the preschool years in their ability to extend novel adjectives to features of objects from diverse basic-level categories, such as extending a novel label for a feature of a basket to the same feature of a spoon (Waxman & Klibanoff, 2000). As with noun learning, preschoolers with SLI have difficulty fast-mapping novel adjectives to novel features and require more exposures to the new words than typically developing children do (Rice et al., 1990; Rice et al., 1992).

Sample Item Items have two trials, one that requires fast mapping and a second that requires extension of the new adjective. In the first trial, children are shown a target property on a familiar object (e.g., oval pattern on a table) through the use of an ostensive label (e.g., “Look at this table. This table is *zavish*”). The image moves up on the screen and becomes smaller as three additional images appear below it: one object from the same basic-level category with a different property (e.g., a table with a solid color pattern), one object from a different basic-level category with the target property (e.g., oval pattern on a chair), and one object from a different basic-level category with a different property (e.g., a bed with a zebra stripe pattern). Children are asked to choose the object that shares the labeled target property (e.g., “What else is *zavish*?”). After this first trial, a second trial asks children to find another instance of the property (e.g., “Show me what else is *zavish*”) as they view a similar array of three new objects. The QUILS contains five Adjective Learning items, one of which is shown in Figure 4.12.

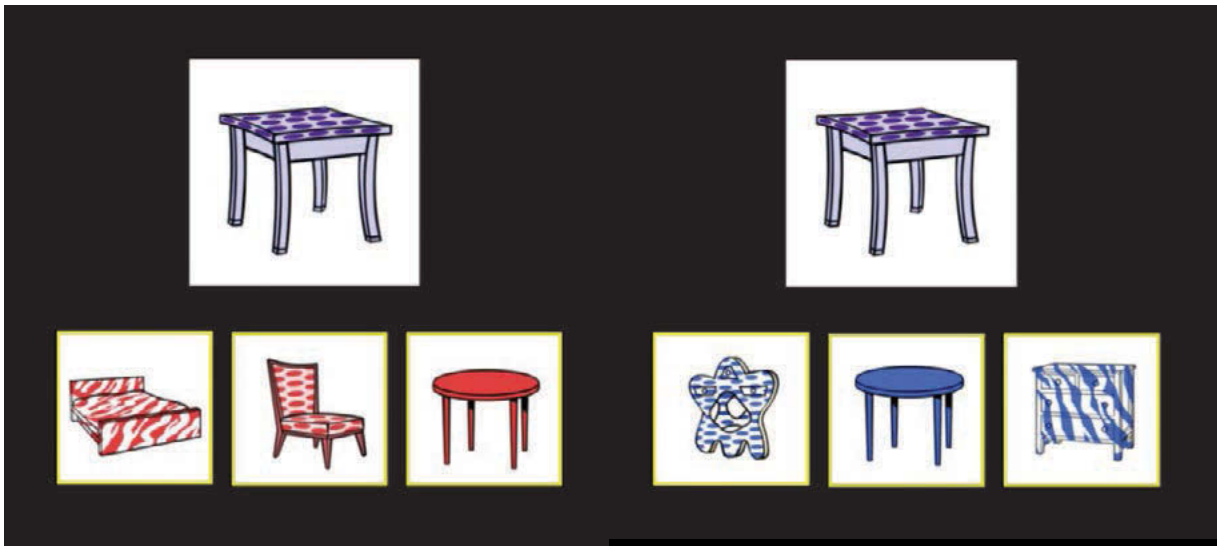


Figure 4.12. Adjective Learning Item 41. Part 1 (Fast mapping): “Look at this table. This table is *zavish*.” Part 2 (Extension): “Show me what else is *zavish*.”

This chapter has provided a brief background about why the developers chose these particular language areas, the rationale for the types within those areas, and examples of particular items in the QUILS.

The next chapter lays out the organization of the QUILS web site.

5 The QUILS Web Site

The QUILS is housed in an online platform that allows easy Internet access to a secure site for screening and the generation of results in convenient report formats. This chapter describes the organization of the QUILS web site.

Access

This section describes the steps for initial access of the QUILS web site.

Login

To log in, go to www.quilscreener.com and click the “Login to QUILS” button. You will be redirected to the QUILS Home page (see Figure 5.1).

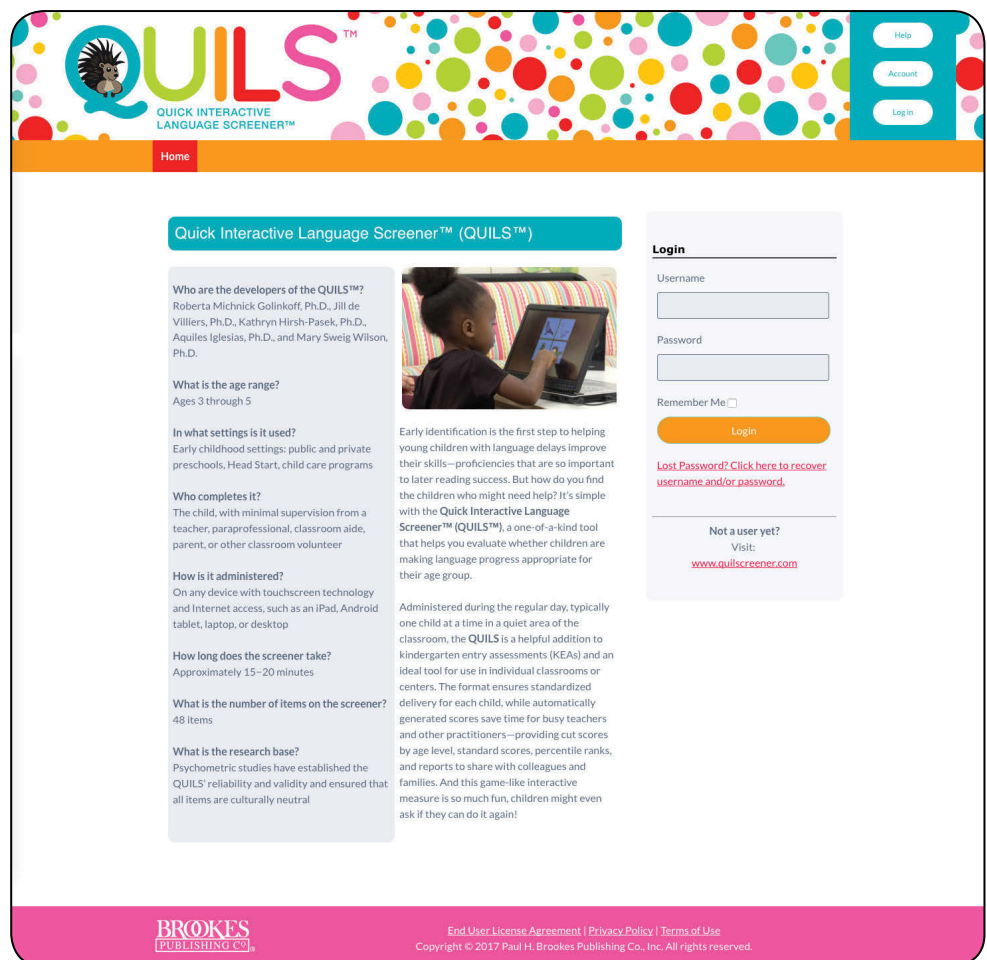


Figure 5.1. The QUILS logged-out Home page.

Username and Password Management

When you purchase a QUILS account, you will receive an e-mail with your account’s username and password. If you forget either, you can retrieve your username or password by clicking “Lost Password? Click here to recover username and/or password” just below the login fields.

Note: You will only be able to be logged in to your account from one device at a time. Logging into the web site from your tablet will log you out of your account on every other device currently using it.

Welcome to the QUILS

The first time you log in to your QUILS account, you will be directed to a page that explains the end user license agreement (EULA). Click “Enroll” to view the EULA.

End User License Agreement

You will be prompted to read and accept the terms of the EULA and the accompanying Terms of Use and Privacy Policy for the QUILS web site. These documents can be viewed and printed from the links in the footer navigation on the bottom of most pages.

Access to the QUILS

After accepting the EULA, you will see the Access page. To proceed to your QUILS account, simply click “Sign up.”

Navigation Bars

After logging in, you will find the main navigation menu at the top of each QUILS web page (see Figure 5.2). This menu includes Home, About, Students, Start Screening, Reports, and Resources.



Figure 5.2. The QUILS navigation bar. This menu includes Home, About, Students, Start Screening, Reports, and Resources.

A brief description of each main page is provided next:

- ❖ **Home:** This page provides a brief introduction to the QUILS, links to technical information and QUILS resources found throughout the web site, and Your Latest Screenings table listing the last 10 screenings conducted in the account.
- ❖ **About:** This page provides an explanation of the overall structure of the QUILS, including the areas, types, and items that make up the screener.
- ❖ **Students:** This page displays a list of all active students currently entered into the account. You can add new Student Records, search for and manage existing Student Records, or view archived students.
- ❖ **Start Screening:** This page presents a list of the 10 most recent screenings in your account, from which you can continue a screening or start a new screening for any of the students displayed.
- ❖ **Reports:** This page presents the report options and explains how to generate each report. From this page, you can generate Group Reports or access the Student Records to generate individual Student or Parent Reports.
- ❖ **Resources:** This page includes downloadable materials and links to useful articles, web sites, and activities.

After logging in, you will find the auxiliary navigation bar in the top right corner of the web site with the following links: Help, Account, and Log out (see Figure 5.3).

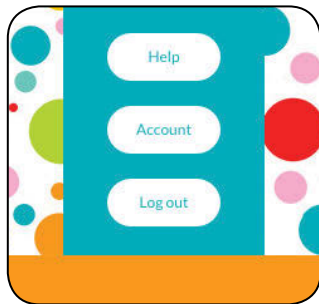


Figure 5.3. The QUILS auxiliary navigation bar.

- ❖ **Help:** This page provides access to the Help Desk Contact Form, the FAQs (frequently asked questions), demo videos of how to create a shortcut to the QUILS web site, the QUILS Feedback Survey, and the User's Manual PDF.
- ❖ **Account:** This page helps you manage the personal details of the main user of the QUILS account.

Following are more detailed explanations of the content of each page.

Home

When you log in to your QUILS account, you will be directed to your account’s **Home** page (see Figure 5.4). On this page, you will find shortcuts to useful information, including links to the Quick Start Guide, the Language Questionnaire, directions for creating a shortcut, the Demo Mode, the FAQs, and the User’s Manual, as well as a list of the 10 most recent screenings in your account.

Po the Porcupine

Po the Porcupine is included on pages throughout the web site to link to relevant sections of the User’s Manual and provide easy access to information about the current page.

Creating a Shortcut

Follow the video instructions to create a shortcut on the home screen of your device or the desktop of your computer to quickly access the QUILS.

Demo Mode

Use the Demo Mode to test your Wi-Fi connection. If a student has started a screening and is struggling with the touchscreen aspect of the screener (e.g., using a fingernail to select answers), you can exit the screener and use the Demo Mode to have the student practice interacting with a touchscreen outside of the screening itself. The Demo Mode consists of the three practice items from the screener, and the results are not saved.

Your Latest Screenings

This table is a shortcut to access the 10 most recent screenings in your account. You can choose to start a new screening for a student previously screened or continue a screening in progress. To start a new screening, click the “Start New Screening” button next to the student. You will be directed to the opening page of the screener. To continue a screening, click the “Continue Screening” button next to the student. The screener will resume automatically at the beginning of the last attempted item.

Figure 5.4. The QUILS logged-in Home page. On this page, you will find shortcuts to useful information, including links to directions for creating a shortcut, the Demo Mode, the FAQs, and the User’s Manual, as well as a list of the 10 most recently started screenings.

About

The **About** page (see Figure 5.5) provides an overview of the three QUILS areas (Vocabulary, Syntax, and Process). Each area is divided into four types. Each type has 2–5 items, totaling 16 items per area. In total, 48 items compose the screener.

Note: The detailed description of the items in each type found here should not be used to “prepare” a student before taking the screener.

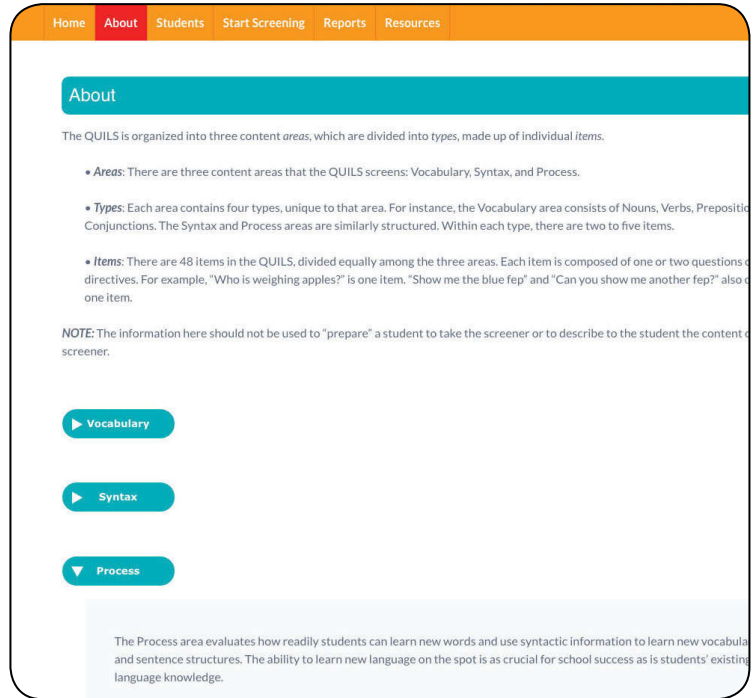
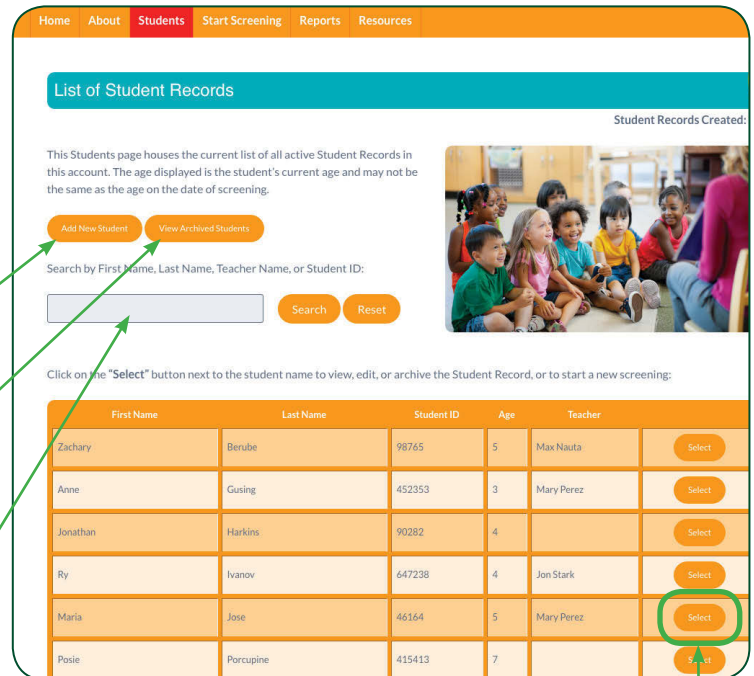


Figure 5.5. The QUILS About page. This page provides an overview of the three QUILS areas (Vocabulary, Syntax, and Process), the types within each area, and the 16 items within each area that compose the screener.

Students

The **Students** page (see Figure 5.6) includes a table of all of your current Student Records. From this page, you can select a student to view the Student Record, view archived students, or add a new student. You can search by first name, last name, teacher, or Student ID.



Click “View Archive Students” to view your list of all archived Student Records that you have selected to remove from your active list of students.

Be careful to only enter exact matches (e.g., if the student’s name is John Smith, enter “John” into the search bar). An incomplete search term or entering multiple search terms (e.g., first name and last name) will not pull up results.

Figure 5.6. The QUILS Students page. The Students page includes a table of all of your current Student Records.

Click “Select” to open the Student Record.

Adding a Student Record

You can add a Student Record (see Figure 5.7) through the Students page. You will be prompted to input certain required fields (flagged with an asterisk), whereas other information is optional.

The screenshot shows the 'Create Student Record' form with the following fields and callouts:

- Date of Birth:** A callout box explains that the birthdate is crucial for screening results and that changes can affect reports.
- Student ID:** A callout box states that this ID does not need to be a school ID number and is used for identifying students in reports.
- Language Questionnaire:** A callout box notes that this field is important for assessing English proficiency and should be completed before screening.
- Ethnicity, Race, and SES:** A callout box indicates these are optional fields for researchers and may be less relevant for schools and child care settings.

The form includes the following fields:

- First Name *
- Last Name *
- DOB * (Format: mm/dd/yyyy)
- Student ID * (Helps identify students without names)
- Gender *
- Is the Language Questionnaire needed before screening this student? *
- Language Questionnaire Score (If answered "Yes", enter score here)
- OPTIONAL INFORMATION:
 - Teacher
 - Class
 - Ethnicity
 - Race (Options: American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, White)
 - SES
- Other Information
- Add Student button

Figure 5.7. The QUILS Create Student Record page.

Required Information

Required information includes the following fields:

- ❖ **First Name:** Enter the student's full first name.
- ❖ **Last Name:** Enter the student's full last name.
- ❖ **Date of birth (DOB):** Either type (mm/dd/yyyy) or select a day on the calendar dropdown to enter a student's birthdate. It is important that the correct date is entered. The standard scores depend not just on the raw scores but on the student's age group.
- ❖ **Gender:** Choose from the dropdown options: Female, Male, Other.
- ❖ **Student ID:** The Student ID field allows you to create a unique identifier for each student. You are able to create new Student IDs for the QUILS or use existing school ID numbers. The Student IDs are important as identifying factors on blinded reports so that a user will be able to match a student to a corresponding report without having to share the student's identity. Student IDs can be any combination of letters, numbers, and special characters as long as it is unique to that student in your QUILS account.
- ❖ **Language Questionnaire:** If you are unsure of a student's English proficiency, please have the Language Questionnaire completed for that student before beginning a screening. See Chapter 6 for more information about the Language Questionnaire.

Optional Information

The following is information that you are not required to enter for a student. These optional fields are included for use by researchers or others for data gathering purposes. Some schools or other settings may ask their users to complete these fields; others may find one or more of these fields useful for their own purpose. (*Note:* Be sure that you are complying with the privacy policies of your school or other work setting if you are using these fields. All of the users that have access to your account will be able to see this information.) These fields include

- ❖ **Class**
- ❖ **Teacher**
- ❖ **Ethnicity:** Options include Hispanic and non-Hispanic.
- ❖ **Race:** The options provided are those used by the U.S. Census Bureau: American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, and/or White. You can make a single selection or check all that apply. To choose more than one, hold "Ctrl" and click the appropriate options.
- ❖ **SES:** Socioeconomic status is defined by levels of maternal education. These levels include: Less than HS Degree, HS Degree or Equivalent, Some College, College Degree, and Post-College.
- ❖ **Other Information:** If you have additional information for a particular student that does not fit within the above categories, you can include it in the space provided. This field can hold notes up to 255 characters in length.

Viewing a Student Record

From within an individual Student Record (see Figure 5.8), you can choose to archive or edit the Student Profile, start screening, continue a screening, or generate reports.

The screenshot shows the 'Student Record' page for a student named Rebecca Stout. The page includes a 'Start Screening' button, a profile section with fields like First Name, Last Name, DOB, Student ID, Gender, and Language Questionnaire Score. Below this is an 'OPTIONAL INFORMATION' section with fields for Teacher, Class, Ethnicity, Race, SES, and Other Information. At the bottom of the profile section are 'Archive' and 'Edit' buttons. Below the profile is an 'Export Student Screenings Raw Data' button with a CSV icon. The 'Screenings' section contains a table with columns for Select, First Access, Days Since Screening, Status, Last Item, and Delete. The table has three rows: a completed screening, an expired screening, and an incomplete screening. Callouts provide details for each of these elements.

Archive
Archiving a student will remove the Student Record from your list of active students. You will not be able to screen the student if the Student Record is archived.

Export
Export the raw CSV data for this individual student, which will include data from all screenings for this student. This data includes the Student ID, date screening began, status of screening, and the student's answer choices.

Select two complete screenings and then click to generate the Status Over Time Report.

If a screening is incomplete, the Last Item column will display the item number that the screener will start with when resumed.

An incomplete screening will expire after 14 days.

Select	First Access	Days Since Screening	Status	Last Item	Delete
<input type="checkbox"/>	2016-02-03 02:49:06	414	Completed - Student Brief Report Student Detailed Report Parent Report		Delete
<input type="checkbox"/>	2017-02-03 03:11:15	47 (Expired)	Screening Expired - You need to begin a new screening.	Q12	Delete
<input type="checkbox"/>	2017-03-22 08:17:37	0	Incomplete - Continue Screening		Delete

[Status Over Time Report](#) * (Select two screenings to compare.)

Figure 5.8. The QUILS Student Record page. From within an individual Student Record, you can choose to archive or edit the Student Record, start screening, continue a screening, or generate reports.

Screenings

Start a New Screening Click the “Start Screening” button to begin a new screening for a student. This is described in more detail next.

Resume a Previous Screening An incomplete screening that is within 2 weeks of when the screening began will be listed on the Student Record below the demographic information as “Incomplete.” To resume the screening, click “Continue Screening.” This will restart the audio from the beginning of the item on which the screener was exited. (Be sure the student is ready to start the screener again before you click this button.) *Note:* For students who have a birthday within those 2 weeks, the screening results will be calculated based on the age of the student at the start of the screening (not as of the date the screening was completed).

Expired Screening If more than 2 weeks have elapsed since you have paused a screening for a student, the screening will be displayed in the Student Record as expired. You will not be able to resume the screening and will need to start a new screening from the beginning for that student.

Delete a Screening If a screening has expired, you can delete it and start a new screening.

Reports

Generate Reports You can generate reports from two locations: a Student Record page or the Reports page (see the Reports section). To generate a report from a Student Record, choose the screening from which to generate the report and then select the type of report you want to generate.

Save or Print Reports Reports are automatically displayed in a PDF viewer within the web site. From the “Save or Print” button, the report can then be downloaded, saved locally, and/or printed. To save a report, click “Save or Print” and then be sure you have selected “Save as PDF” as the destination in the Print previewer. For additional information, please see the Printing Reports section under Sharing Reports.

Export Raw Data

The raw data associated with a specific QUILS account is the property of the account holder. These data can be exported on an individual student basis. (For this version of the QUILS web site, group exports of data are not possible.) The export provides the student’s answers to each item on the QUILS for each screening completed by that student, the Student ID, the date the screening began, and the status of each screening as a comma-separated values (CSV) file. *Note:* To convert the student’s answers into raw scores, see Table 9.3. Be sure you have exported any data you will want to retain before terminating your subscription. See the FAQs on the QUILS web site on how to access your data.

Editing a Student Record

The Student Profile in the Student Record can be edited at any time. You can update required information or add new information in the optional fields. Make sure that the student’s birthdate is entered accurately. If an error is made and you want to correct the birthdate after a screening has been started, the change may affect the scoring and recommendation function. Please note that anyone with login information to your account can edit information in a Student Record.

Archiving a Student Record

If a student is no longer an attendee of the school or other program using the QUILS, that Student Record can be archived. Archiving will remove the student from the active list of students who can be screened. It will not erase any of the student’s information or previously completed screenings.

Reactivating a Student Record

Archived students can be reactivated at any time. Reactivating a student will remove the student from the list of archived students, and you will be able to edit the Student Profile or begin a new screening for that student.

Start Screening

You can begin screening at any time by clicking on the **Start Screening** page on the top navigation bar (see Figure 5.9). You can select to continue or start a new screening from the Your Latest Screenings table or click “Access All Student Records” to see all active students you currently have in your account on the Students page. From that list, you can search and select the student for whom you would like to begin a screening. If the student is not already in your account, you can create a Student Record for that student and then begin a screening.

Begin Screener Before beginning a screening, be sure to set your browser to full screen. For more information about how to do this, refer to the Technical Requirements for Using the QUILS section at the end of this chapter. After you select to start a new screening, the opening page of the screener will appear (see Figure 5.10). Be sure to check the volume setting of the tablet or touchscreen computer (ensuring it is not too loud or too soft) before beginning a screening. If using headphones, check that they are working properly. Close any background programs or other browser tabs that might produce audio or visual pop-ups and could interfere with the screening.

Once you start the screener, it will advance automatically through all 48 items. Images are displayed, and the student will make selections based on the audio instructions. (See Chapter 6 for details on the presentation of the items and screener administration.)



Figure 5.9. The QUILS Start Screening page.



Figure 5.10. The QUILS Begin Screener page. After you select to start a new screening, the opening page of the screener will appear.

Pause or Exit Screener Before you start a screening, be sure you are familiar with the location of the “Pause” button in the top left corner of the screener window (see Figure 5.11). You can pause the screening at any time by clicking the “Pause” button (i.e., if the student sneezes or there is a momentary distraction). Resume the screener by clicking the “Pause” button again. If you are only pausing for a brief period of time but you have paused the screener in the middle of an item, we recommend you exit the screener (using the “Exit” button in the top right corner of the screener) and resume from the Student Record page so that the question or directive will restart from the beginning of the audio for that item. When you exit out of the web page by clicking the “Exit” button in the upper right corner of the screening window, the screener will automatically save the student’s progress. “Exiting” is a good choice for a fire drill, if a student needs a break, or if screening will need to be resumed on another day. Generally, “exiting” will be a more practical choice because it ensures the student has the benefit of resuming at the beginning of an item.

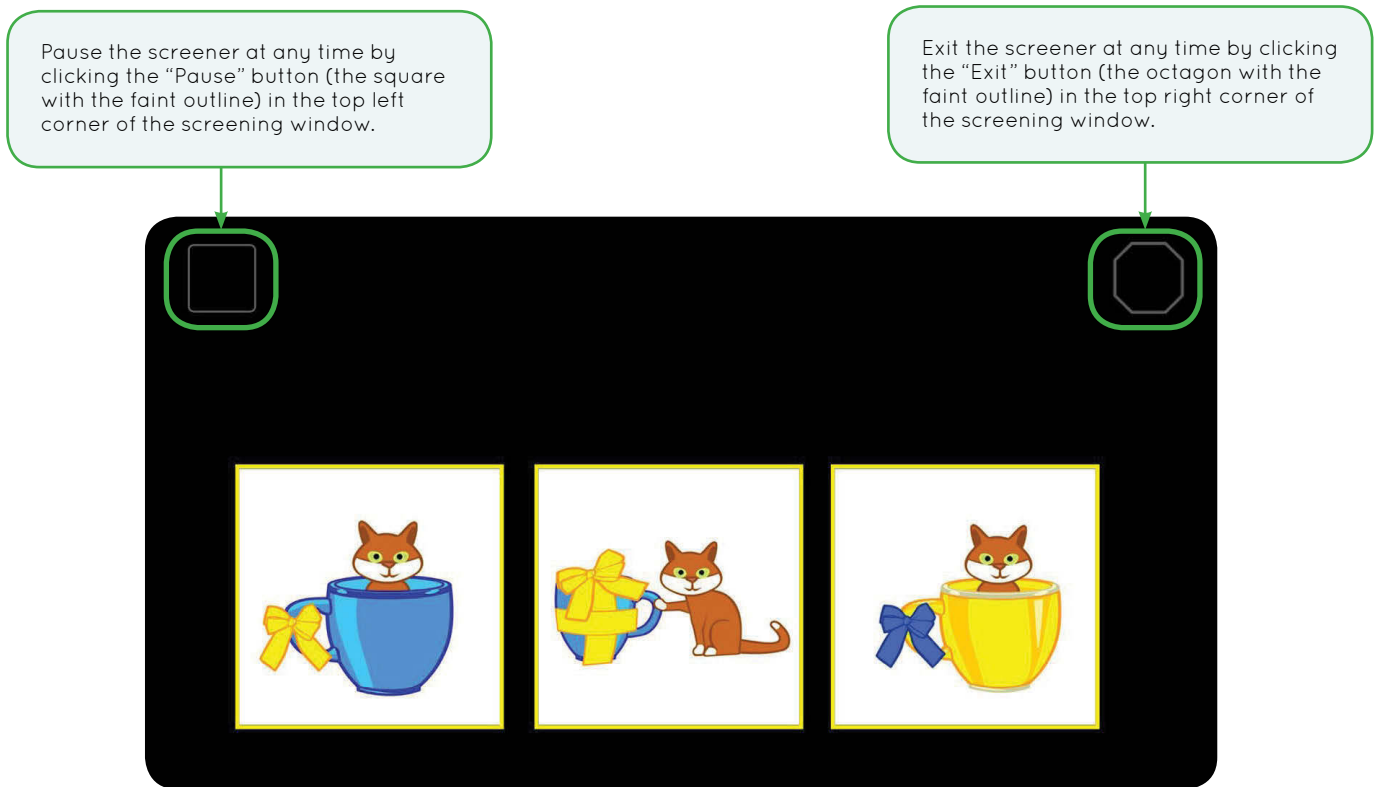


Figure 5.11. The QUILS navigation buttons.

Resume Screener You can resume the screener any time within 2 weeks of beginning the screening. Once you click to resume the screener from a Student Record or from Your Latest Screenings table, the screener will restart at the beginning of the last item the student viewed (but did not complete) when the screening was exited. (Note: The audio for the last item attempted will begin automatically, so the student should be ready when you click the “Continue Screening” button.)

After Screening After the student has completed the screener, a final screen will display a message for you and the student (see Figure 5.12). At this time, return the student to the classroom before you exit the screener. Once you click the Exit button, you will be taken back to the Student Record. From there, you can choose to generate a Student or Parent Report or navigate to a different Student Record to start a different screening.

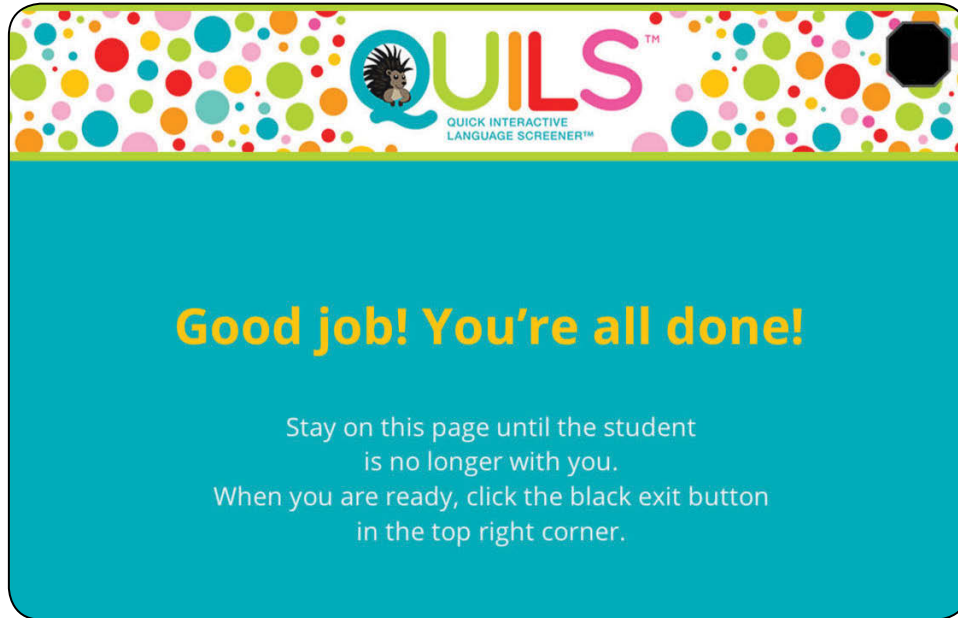


Figure 5.12. The QUILS End Screener page.

Reports

The **Reports** page of the QUILS (see Figure 5.13) allows you to generate reports for a single student or a group of students. Reports can only be generated for completed screenings. There are various types of reports available, detailed next.

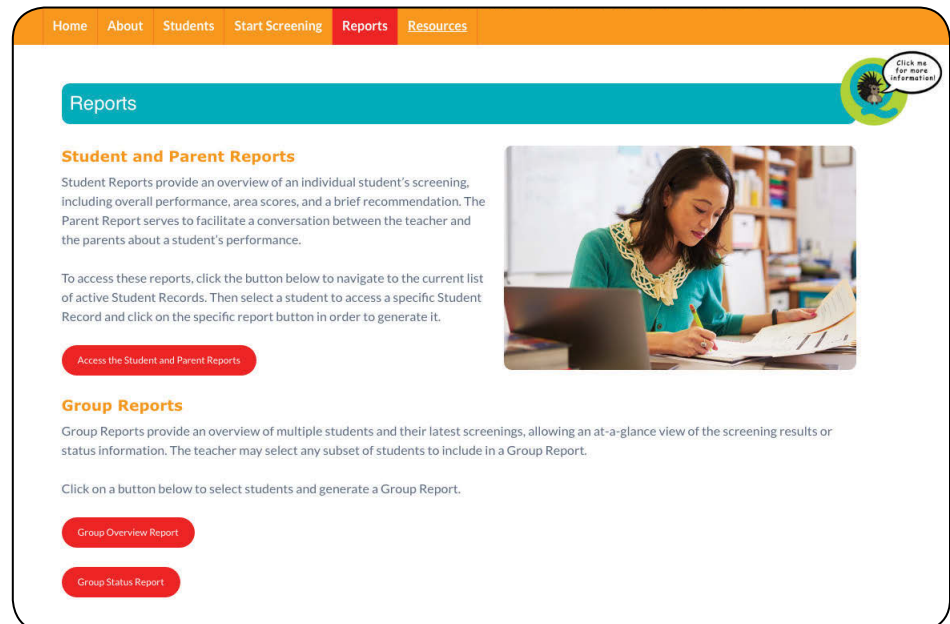



Figure 5.13. The QUILS Reports page. The Reports page of the QUILS allows you to generate reports for any student or group of students.

Student Reports

Once a student has completed the screening, you can generate a variety of reports to view that student's results. Student Reports provide an overview of the student's screening, including overall performance, area scores, and brief recommendations. Brief descriptions of each Student Report follow. (For more information on scoring and interpreting the QUILS, refer to Chapter 7.)

Student Brief Report This report provides a brief overview of the student's individual screening (see Figure 5.14). It includes the student's overall score as well as his or her area scores for Vocabulary, Syntax, and Process. A bar graph displays the percentile ranks based on the relevant age norms. A separate section indicates follow-up recommendations for the student.



Student Brief Report

Student Information

Student Name: Rosalia Martinez
Student ID: 2415

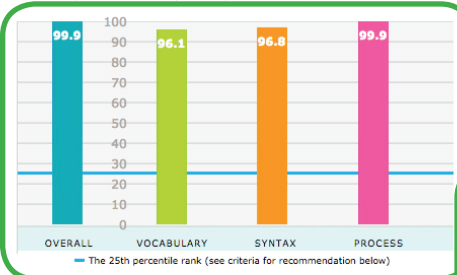
Date of Birth: 01/18/2013
Date of Screening: 01/19/2017
Age at Screening: 4 years

Strong language skills are essential for every student's success in school and in life. The QUILS measures a student's emerging abilities in Vocabulary, Syntax, and Process and offers an overall rating. These results are expressed as standard scores and percentile ranks. (See Chapter 9 of the QUILS User's Manual for more information.)

Rosalia Martinez's Performance

On 01/19/2017, Rosalia Martinez's language skills were screened using the Quick Interactive Language Screener™ (QUILS™). The overall percentile rank of 99.9 means that Rosalia Martinez scored as well as or better than 99.9% of 4-year-olds in the standardization sample. In addition to the overall results, standard scores and percentile ranks for each of the three areas of the QUILS were calculated. Based on these calculations, a recommendation is listed below for Rosalia Martinez's results.

Graph showing the student's overall and area percentile ranks.



Brief recommendation regarding whether the student should be evaluated at this time.

Overall		Vocabulary		Syntax		Process	
Standard Score	Percentile Rank	Standard Score	Percentile Rank	Standard Score	Percentile Rank	Standard Score	Percentile Rank
135	99.9	125	96.1	126	96.8	133	99.9


Vocabulary area asks about words students use or understand, including ordinary things (toys), actions (verbs), prepositions, and conjunctions.
Syntax area asks about structure of sentences including wh-questions, tense markers (past tense), prepositional phrases, and embedded clauses.
Process area asks about learning new words (verbs, nouns, and adjectives) and about how children use syntax, such as converting active sentences to passive sentences.

Recommendation:

Based on Rosalia Martinez's performance on the QUILS, Rosalia Martinez's language comprehension appears to be within the typical range relative to age, and no follow-up evaluation is recommended at this time.

Criteria for recommendation:

- Students with an overall percentile rank below 25 should be referred for follow-up evaluation.
- Students with a percentile rank below 25 in the Process area (regardless of the Vocabulary and Syntax scores) should be referred for follow-up evaluation.
- Students with percentile ranks below 25 in both Vocabulary and Syntax (regardless of the Process score) should be referred for follow-up evaluation.

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Provides the standard score and percentile rank for the student's results overall and for each area.

The criteria for recommendation describe the situations for which a student should be referred for follow-up evaluation.

Figure 5.14. The QUILS Student Brief Report. This report provides a brief overview of an individual student's screenings.

Student Detailed Report This report provides all the information included in the Student Brief Report plus a detailed breakdown of the student’s answers and raw score to every item in the screener (see Figure 5.15). This report enables inspection of the child’s responses in different areas and for different item types to help identify aspects of language comprehension where the student might benefit from additional support. The raw scores can support the in-depth look at a student’s performance in certain areas and types in the screener (for an example see Case 5 in Chapter 8). The total raw scores are provided for the overall screener and for each area at the end of the report. The data tables in Chapter 9 can be used to inform your understanding of the student’s performance against the standard scores and percentile ranks. Figure 5.15 combines screenshots of two sections of the Student Detailed Report that are not shown in the Student Brief Report.

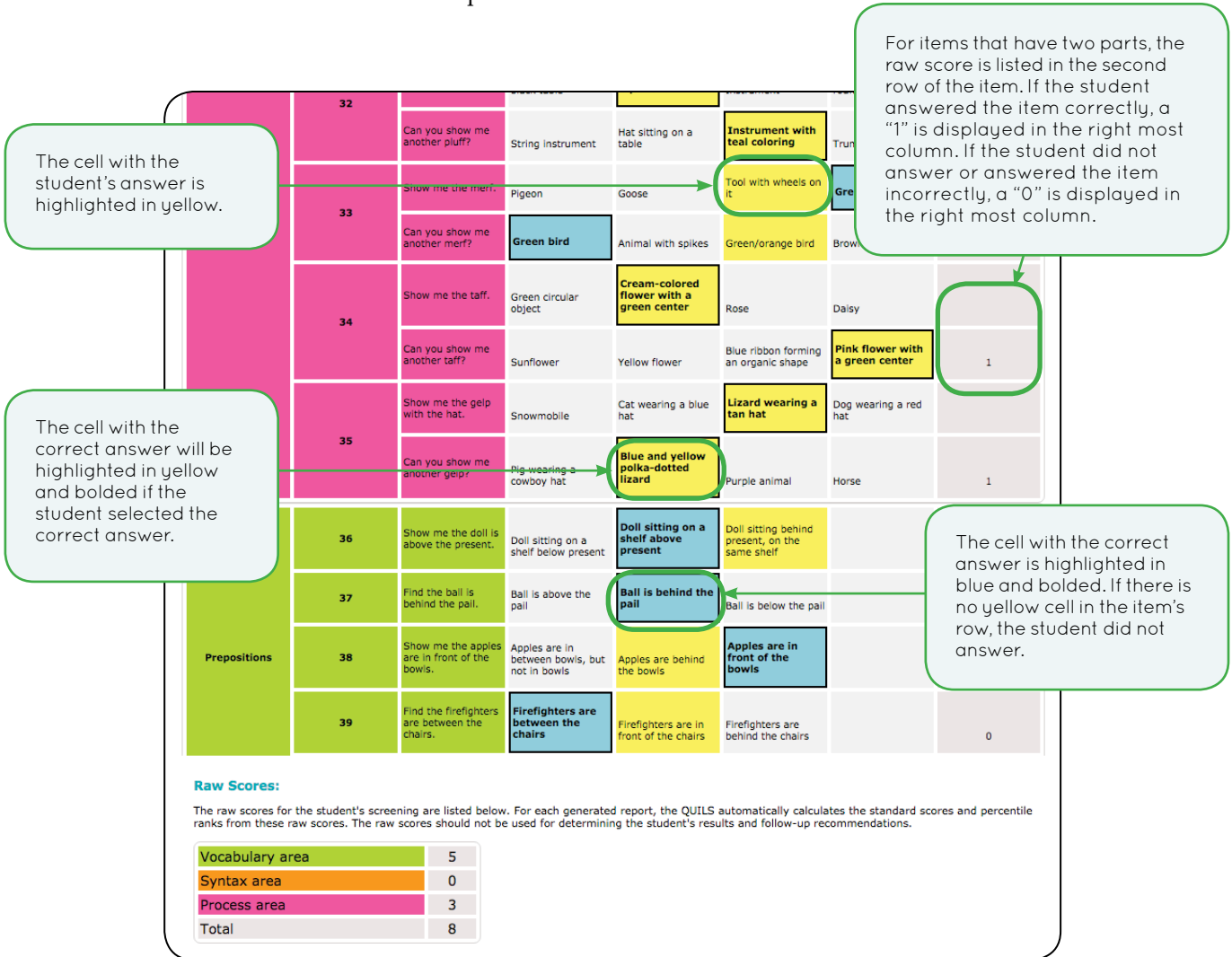


Figure 5.15. A portion of a QUILS Student Detailed Report. This report recaptures the entire Student Brief Report as well as a detailed breakdown of the student’s answers to every item in the screener.

The Student Detailed Report also provides a more detailed recommendation (see Figure 5.16), which covers how the student scored in each area relative to the cut scores for the student’s age range and explains which results would indicate referral is recommended for the student for language evaluation.

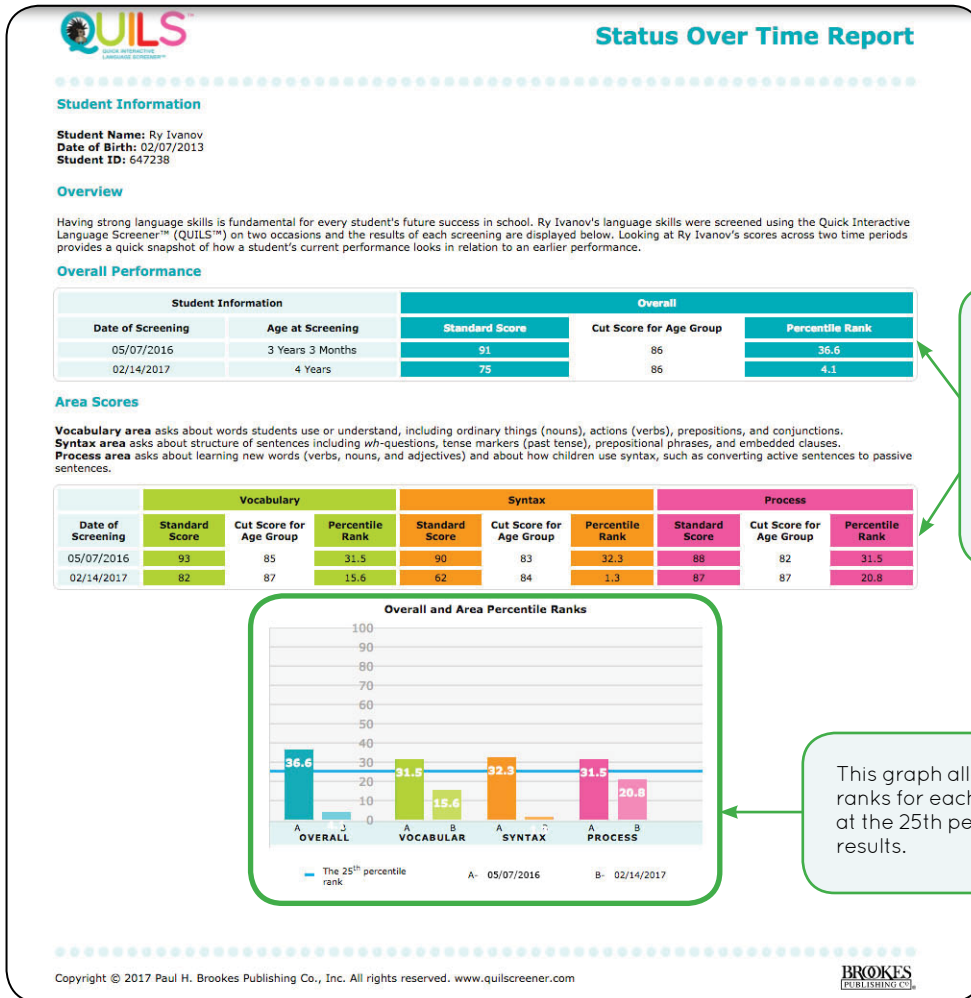
Summary and Recommendation

Based on the overall score, the student is recommended for follow-up assessment at this time. Based on the student’s individual area standard scores, the student is recommended for follow-up assessment in:

- * Vocabulary
- * Syntax
- * Process

Figure 5.16. The QUILS detailed recommendation.

Status Over Time Report This report allows you to compare two screenings for the same student against the respective age norms for the dates of screening (e.g., if the student has a birthday in between the two screening dates, the report automatically uses the correct cut scores for the corresponding age range). It will provide an indication of the student’s language capability as demonstrated by the QUILS at two different points in time (see Figure 5.17).



For the overall score and the area scores, this report presents the student’s standard scores and percentile ranks for each screening. For reference, this report also lists the cut score (i.e., the minimal score a student would need to be above the 25th percentile rank) for the relevant age group.

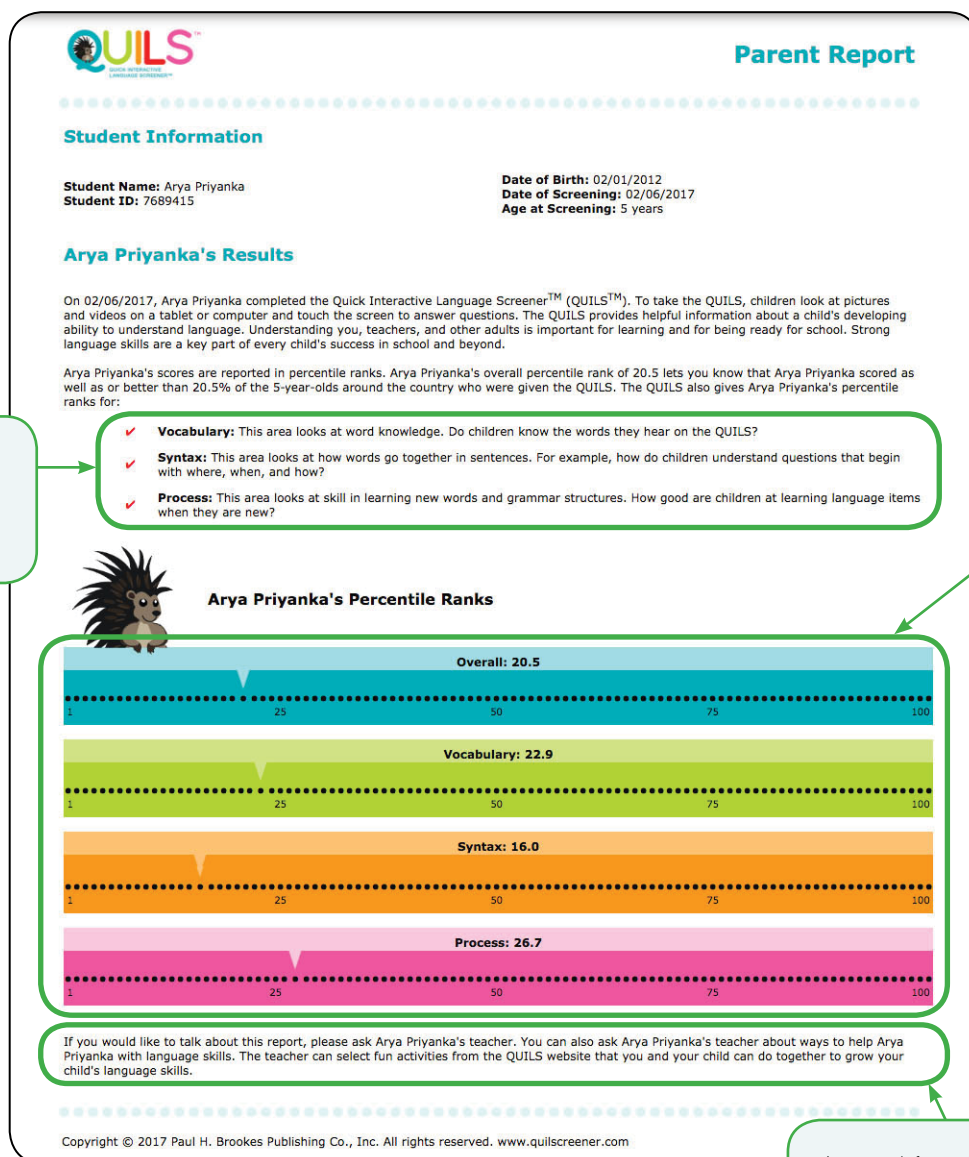
This graph allows a comparison of the percentile ranks for each screening and shows the cutoff at the 25th percentile rank across the student’s results.

Figure 5.17. The QUILS Status Over Time Report. This report allows you to compare two screenings for the same student against the respective age norms for the dates of screening.

Parent Report

The Parent Report provides an effective way to inform parents and other primary caregivers that their child has completed a screening with the QUILS. This report displays the student's percentile ranks for the overall performance as well as performance in each area (see Figure 5.18). It explains the QUILS using easy-to-understand language in order to be more accessible to families. The report also refers to the resources available through the QUILS web site in order to facilitate a conversation between teachers/administrators and parents.

On the Resources page, the Tips for Discussing Reports with Parents (under the Downloadable Materials section) will help guide that conversation. Teachers and administrators can also provide parents with the links for web sites in the Tips for Parents section, which includes tips, strategies, and activities specifically for parents as they support their child's language skills development.



Simple explanations are provided for each area.

Easy-to-interpret graphical representation of the percentile ranks.

A parent-friendly recommendation is provided.

Figure 5.18. The QUILS Parent Report. This report provides an overview of a student's individual screening, including overall performance, area scores, and a brief recommendation.

Group Reports

The Group Reports enable an overview of multiple students based on selected criteria, allowing an at-a-glance view of screening results or status information. The teacher may select any subset of active students in the account to include in Group Reports, and the reports will automatically include the last screening for each student selected within the previous 12-month period.

Group Status Report The Group Status Report (see Figure 5.19) helps monitor which students have or have not completed the QUILS. For each student within the selected set, the Group Status Report will display the status of the most recent screening within the past 12 months: Complete, In progress, In progress—Expired, or Not Started.

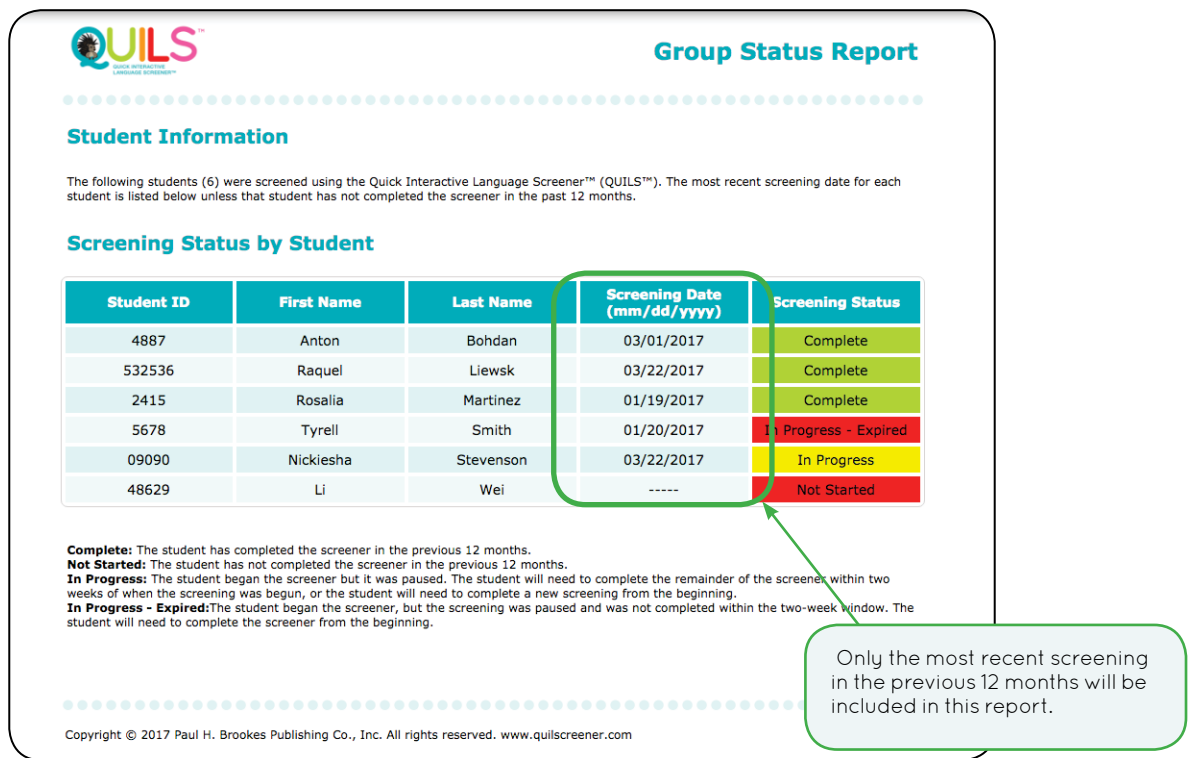


Figure 5.19. The QUILS Group Status Report. This report provides an overview of multiple students based on selected criteria, allowing an at-a-glance view of the screening results or status information.

Group Overview Report The Group Overview Report provides a group snapshot of students' performance in each area of the QUILS as well as overall. With this information, teachers can make planning decisions based on students' language comprehension skills. The Group Overview Report displays a grid of students' overall percentile ranks for each area score and for their overall score (see Figure 5.20).

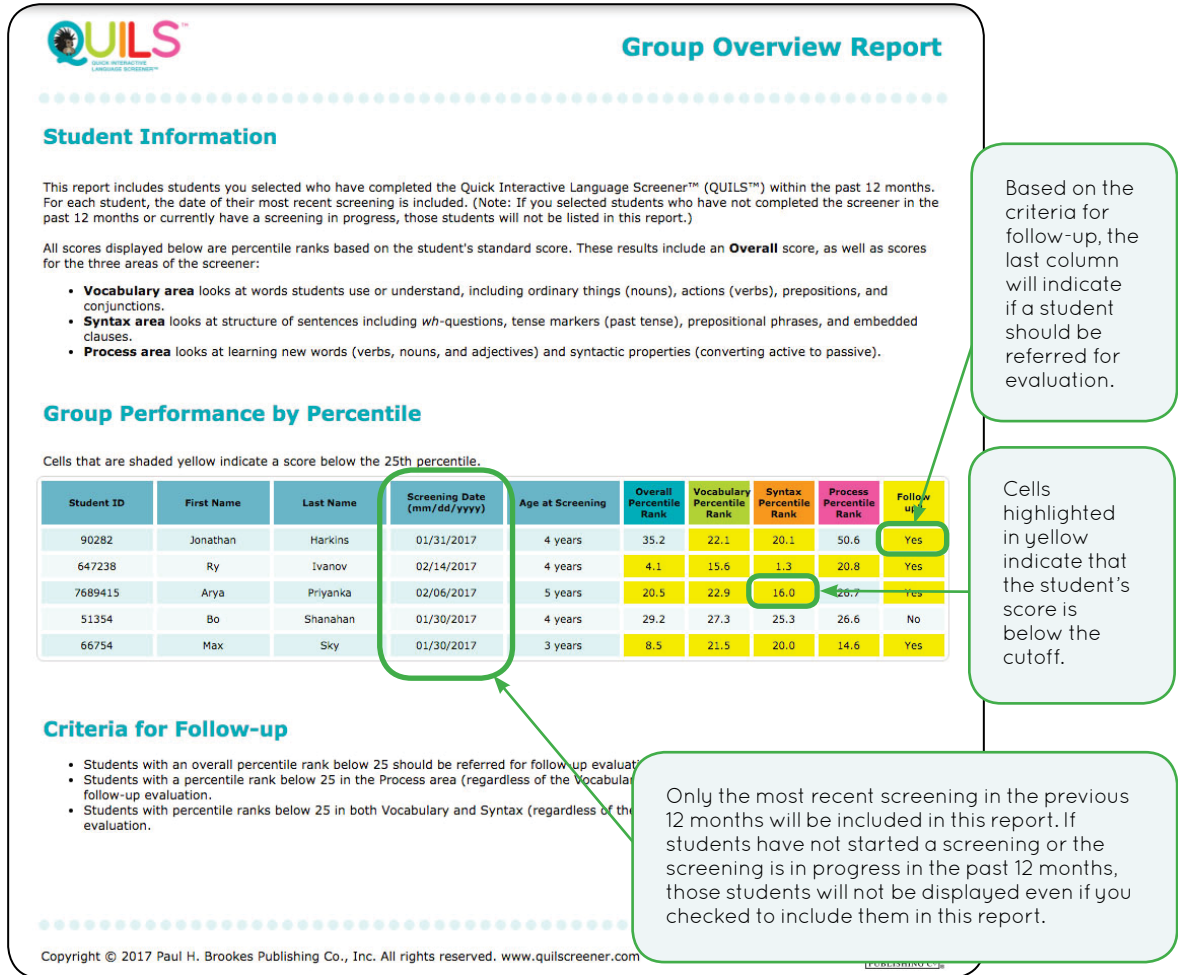


Figure 5.20. The QUILS Group Overview Report. This report displays a graph of the students' overall percentile ranks to view the status of all of the students.

Sharing Reports

E-mailing Reports The QUILS web site provides the functionality to download reports in order to easily attach them to e-mails.

Note: Be sure to follow your school's or employer's guidelines for e-mailing student information. You are responsible for complying with applicable federal, state, and local laws and regulations. For example, Family Educational Rights and Privacy Act (FERPA) regulations may be applicable. The "blinding reports" functionality described next might help you with compliance, but it is your responsibility to ensure that you share information appropriately.

Blinding Reports You have the option to "blind" any report before you download or print it. This will remove the student's first and last name. The report will be identified by the Student ID but will also contain the student's birthdate in order to calculate the appropriate age range. To blind a report after generating it, click the "Hide Name" button at the top of your PDF previewer screen (see Figure 5.21).

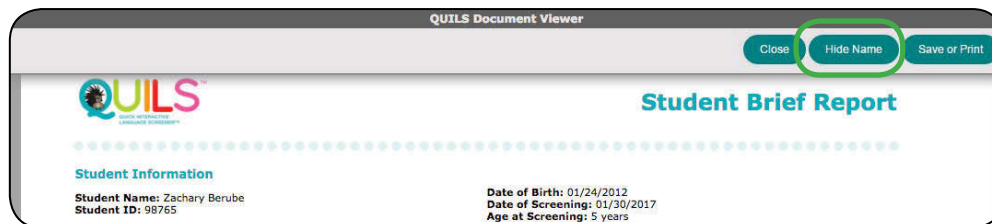


Figure 5.21. How to mask or "blind" a Student Report for export.

Printing Reports All reports are formatted to be printed on 8.5 x 11 paper. They may be printed in black and white or in color. If you have a color printer available, the color coding facilitates interpreting the reports. In order to print in color, be sure to click "Background graphics" under Options on the Print previewer.

Resources

Resources for educators and parents can be found on the **Resources** page, which is divided into two sections (see Figure 5.22). The first section contains downloadable materials that will help you in using the QUILS, including the Language Questionnaire, the Quick Start Guide, and tips for discussing results with parents. The second section includes general resources that will support your efforts to encourage language development, including links to web sites, activities, and articles about language development. As parents will not have access to the QUILS site, we have provided a URL (www.quil screener.com/parent-resources) which parents can use to access articles with tips and activities for encouraging language development in their young children. We recommend that you review the resources as you are reviewing the student's results, as you can select resources that are specifically applicable to that student.

Home About Students Start Screening Reports Resources

Resources

Language plays an important role in a student's overall development, school readiness, and later academic success. These Resources will assist you in using the QUILS, understanding language skill development, and supporting a student's language skill development in a variety of ways. The first section, **Downloadable Materials**, contains information that will help you in administering the QUILS. The second section, **Early Childhood Resources**, provides links to articles about language development and how to promote students' growth. The third section, **Language Activities**, includes activities for teachers, practitioners, and parents to support the development of language skills in young students. The fourth and fifth sections, **Tips for Teachers** and **Tips for Parents**, include useful tips and ideas that will support teachers' and parents' efforts to encourage language development.

Downloadable Materials

Early Childhood Resources

Language Activities

Tips for Teachers

Tips for Parents

Activities to Encourage Speech and Language Development:
The American Speech-Language-Hearing Association (ASHA) has provided age-appropriate ways that parents can engage their young children to help develop speech and language abilities.
<http://www.asha.org/public/speech/development/parent-stim-activities.htm>

Shared Storybook Reading:
Research has shown that using responsive strategies during story time can boost children's early literacy success. This handout includes 11 tips to build children's language skills.
<http://archive.brookespublishing.com/newsletters/downloads/11Tips.pdf>

Books Build Connections Toolkit:
Find information about the benefits of promoting early literacy and early learning for children and what you can do about it in the Books Build Connections Toolkit. The toolkit has publications with information and tips for pediatric professionals and families. Encourage families to talk, read, and sing with their children!

Figure 5.22. The QUILS Resources page. Teachers can find resources, including downloadable materials and general resources, that will support their efforts to encourage language development.

Help

There are several online help and support resources available to you as you use the QUILS. The User’s Manual is always available through the **Help** section of the web site (see Figure 5.23), accessed through the auxiliary navigation bar in the top right corner of the web site.

FAQs are also included on the Help page to address any questions you may have about using the QUILS, generating reports, or navigating additional functionality in the QUILS web site. If you have a technical question that is not listed, please submit the Help Desk Contact Form. If you have a general question about the QUILS or the research behind it, please submit your question at <http://support.brookespublishing.com/new> by selecting Product Inquiry for the Category and selecting QUILS. We will work to address any queries you have as quickly as possible.

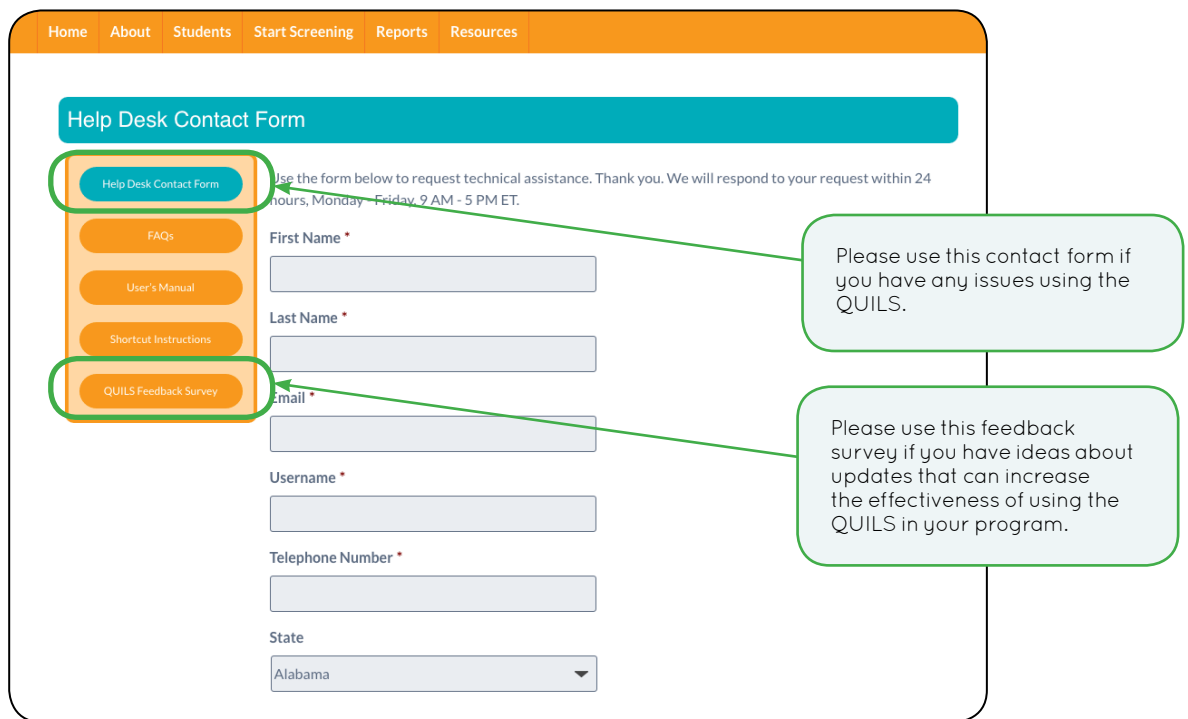


Figure 5.23. The QUILS Help page. Teachers can access the User’s Manual, look up FAQs, contact the Help Desk for technical troubleshooting, and contact Brookes Publishing with general questions about the QUILS.

Account

On the **Account** page, you will be able to update any of your information, including the main name and e-mail address for the account. If you are sharing an account with additional people at an individual site, please keep the e-mail address updated for the main account administrator; we will use this information to notify the main account administrator about any changes to the QUILS subscription. This e-mail address is also used to send the account username and password if a user forgets.

Technical Requirements for Using the QUILS

Recommended Hardware and Software

You can use the QUILS on tablets and touchscreen computers with several current browsers. Recommended are Chrome, Firefox, and Safari. We advise against using Internet Explorer as it can cause a variety of functionality issues, including, for example, interference with the audio in the screener, issues with how the web site displays, and discrepancies that can alter scoring results. Be sure to use a screening location with a strong Wi-Fi connection (a minimum of 10–15 MB/s downloading speed). You can preview any report through the web site document viewer, but when downloading the reports, we recommend having a PDF viewer program installed on your device (e.g., Adobe Reader).

Computer Settings

If you are using a touchscreen computer or laptop to conduct a screening, be sure that your browser is set to full screen. For example, on Windows browsers (Chrome, Firefox), you need to press the F11 key to enter full screen. If you are using Safari on a Mac, click the green button located on the top left corner of the screen and make sure that “Always Show Toolbar in Full Screen” is unchecked. This option is under the “View” menu in Safari.

Web Site Security and Information About Your Data

Your data will be backed up daily on the system’s server. The server is firewall protected and is monitored 24/7. The server security and system logs are reviewed regularly, and the software is maintained with the latest security updates.

QUILS Data You retain ownership and maintain control only of data you input, such as screening data in the Student Record. For more information on ownership, please refer to the “Intellectual Property” and subsequent sections in the Terms of Use. The Terms of Use can be reviewed at any time by clicking on the link in the footer on the Home page and most other pages of the QUILS web site.

6

Conducting the Screening

This chapter covers all the steps involved in preparing for and giving a screening, from setting up the Student Record through delivery of the screening. Prior to screening, adults who will be supervising should read this chapter to familiarize themselves with the QUILS. Included on the QUILS web site is the Quick Start Guide, which is a brief overview providing essential information for administering the screener. Chapter 1 also provides a general overview of the QUILS. This chapter offers more detailed information about the best way to administer the screener.

Preparing to Use the QUILS

The administration of the QUILS, as well as the recording of the student's performance, is carried out on a touchscreen tablet or computer, so that any responsible adult can administer this screener. Any adult supervising a screening should have experience working with children so that he or she can encourage the child and be a supportive presence as the child goes through the items. (The adult can become familiar with the screener's visual and audio display by using the Demo Mode.) It is also crucial that the adult not encourage the child to respond in any particular way to any particular question.



For example, if a student is reluctant to make a choice for any question or directive, the narration will repeat the audio again after a 20-second pause. The adult should not prompt the student but wait patiently for this repetition. The software will advance automatically to the next question or directive after the student selects an answer or does not provide a response for another 15 seconds.

During the screening, an adult needs to sit with the student for several reasons:

1. *To make sure that the student understands the task.* Three practice items precede the actual screener items. The vast majority of children pass these items because the items ask for children to find pictures that represent highly familiar words (e.g., *teacher*) and sentence structures (“Who is feeding the baby?”). However, for a child who is having difficulty with the practice items, the screening might need to be stopped. This could occur, for instance, if the child has an undetected hearing loss or an attentional issue. Further exploration of the child's capabilities may be warranted before resuming the screening.
2. *To be certain that the student completes the screener.* If the child cannot sit for all 48 items or needs to go to the bathroom, the adult can pause or exit the screener and give the child the needed break.

3. *To intervene if the student does not wish to continue (a very rare occurrence).* A child who shows reluctance to proceed will need to be either coaxed to continue or offered a break. In the experience of the test developers, though, children enjoy the screener and do not have difficulty attending for its duration.
4. *In case of an emergency.* Should there be an unexpected interruption, perhaps caused by a fire drill or other unanticipated event, the adult will need to exit the screener. More information on how to resume or cancel the screening and start over is provided below.

Ensuring Children's Eligibility

Children who are screened with the QUILS should be proficient English speakers in order for the norms to be applicable. Children who are not primarily English speakers could be inappropriately identified as needing follow-up evaluation.



When the teacher is aware that the child has been exposed to a language other than English, he or she should give the child's primary caregiver the brief Language Questionnaire that accompanies the QUILS to determine which version of the screener is most appropriate for the child (see Figure 6.1). This questionnaire asks a primary caregiver (i.e., the adult who spends the most time with the child) to report the degree to which the child communicates in English and another language with family members and peers at home, not at school.

The Language Questionnaire is an adaptation and modification of items from the Home Survey used by Branum-Martin, Mehta, Carlson, Francis, and Goldberg (2014). Branum-Martin et al. (2014) report that these Home Survey items "are widely used in research on Spanish-speaking families (Duursma et al., 2007; Mancilla-Martinez & Lesaux, 2011; Reese & Goldenberg, 2008; U.S. Department of Education, National Center for Education Statistics, 1996)" (p. 185). To create the Language Questionnaire for use with the QUILS, the development team selected and modified 7 questions from the 12 spoken language items of the Home Survey and used these adapted versions with a scoring rubric similar to that used in the original Home Survey. QUILS users may make copies of the Language Questionnaire for use with families provided each copy bears credit to the original source as shown in Figure 6.1. (See this Manual's copyright page for more information.) QUILS users may also download the Language Questionnaire from the Resources page in the QUILS web site.

If it is unclear who the primary caregiver is, the teacher should use the student's main contact on file. If the primary caregiver has difficulty reading the form, then another adult can read the questions aloud for that individual. The primary caregiver may not be able to provide an answer for each question. For example, the child might not have a secondary caregiver or might not have siblings. In each of those scenarios, the primary caregiver would leave those questions blank.

To score the questionnaire, assign 1–5 points for each question (going from left to right). *Only English* = 1 point, *mostly English* = 2 points, and so forth. Calculate the average score for all answered questions by adding the questions' scores together and dividing by the number of answered questions. The result is a Language Score from 1 to 5. If the child's score is 1.5 or less, he or she can take the monolingual English QUILS. In other words, the QUILS may be given if the Language Questionnaire reveals that the child has relatively minimal use of a second language (i.e., is mostly monolingual). For more information about administering and scoring the Language Questionnaire, please see the Language Questionnaire Instructions and Scoring Guide available for download from the Resources page of the QUILS web site.

A child who comes from a Spanish-speaking household and scores higher than 1.5 on the Language Questionnaire can take the QUILS: ES, available separately. At present,



LANGUAGE QUESTIONNAIRE

to accompany the QUICK INTERACTIVE LANGUAGE SCREENER™ (QUILS™)

Completed by: _____ Date: _____

Student's name: _____

Relationship to student: _____

This questionnaire should be used when a student hears or speaks more than one language at home. For each question, please check the one box that best describes your family.

What language does the primary caregiver use when speaking to the child?

Only English

Mostly English

English and another language

Mostly other language

Only other language

What language does the secondary caregiver use when speaking to the child?

Only English

Mostly English

English and another language

Mostly other language

Only other language

If there are siblings, what language do they use when speaking to the child?

Only English

Mostly English

English and another language

Mostly other language

Only other language

What language does the child use when talking to the primary caregiver at home?

Only English

Mostly English

English and another language

Mostly other language

Only other language

What language does the child use when talking to the secondary caregiver at home?

Only English

Mostly English

English and another language

Mostly other language

Only other language

What language does the child use when talking to the siblings at home?

Only English

Mostly English

English and another language

Mostly other language

Only other language

What language does the child use when talking to friends outside the home?

Only English

Mostly English

English and another language

Mostly other language

Only other language

The Language Questionnaire, used with the Quick Interactive Language Screener™ (QUILS™), is adapted and modified from Branum-Martin, L., Mehta, P.D., Carolson, C.D., Francis D.J., & Goldenberg, C. (2014). The nature of Spanish versus English Language use at home. *Journal of Educational Psychology, 106*(1), 181–199. Photocopies may be made provided this credit line appears on each copy.

For more information on the QUILS: www.quilscreener.com or www.brookespublishing.com/quils

Figure 6.1. The Language Questionnaire should be completed by a parent or family member when the child's familiarity with English is uncertain. (Note: Users may make copies of the Language Questionnaire from an original User's Manual or from the QUILS web site, provided each copy maintains the credit line shown at the bottom of Figure 6.1. Copies of the Language Questionnaire may be made to support use of the Quick Interactive Language Screener™ [QUILS™], provided the user is not charging a fee.)

there is no version of the QUILS available for children who are bilingual in English and a language other than Spanish.

Allowing Time for Screening



Allow 15–20 minutes per child to administer the screener. Schedule time to administer the QUILS when children are most likely to be alert and rested.

The QUILS can be paused or exited and resumed if the student needs a break, but the system only allows a screening to be resumed within 2 weeks of the initial start date.

If the adult supervising the screener needs to exit out of the screener at any time during administration (e.g., to allow for a bathroom break), the screener will resume at the beginning of the item on which the screener was stopped. In the case where the screener is stopped in the second half of a two-part item, the screener will resume at the beginning of the first part of the item, clearing the initial response and scoring the item as a whole.

If more than 2 weeks has passed since beginning the screener, the screening will indicate that the screening session has expired. The adult may start a new screening for the student.

Checking Students' Familiarity with Touchscreens

Many children are familiar with touchscreens from very young ages, so the delivery format of the QUILS is not off-putting to them. Indeed, many children have played games on touchscreen devices, so the QUILS may seem like another game to them, but keep in mind the following pointers for assisting students who might be having difficulty.

- ❖ Some students will not press down on the screen hard enough. If this happens, you might say something like, *“You’re doing a great job; just press a little bit harder”* or *“Hold your finger down a little bit longer.”* The adult should not continue the screening if the child is not successful in pressing the screen. We suggest exiting the screener and having the child practice using a touchscreen in the Demo Mode, which can be found on the Home page of the QUILS web site. This way, the child can practice using the touchscreen with the practice items in the Demo Mode until the student can do so effectively, at which point the adult can resume giving the screener.
- ❖ Touchscreens usually do not register fingernail touches. If a student consistently touches with a fingernail, the adult should demonstrate the proper way to touch the screen. *“See? Use the flat part of your finger!”* The adult might also recommend that the child use his or her thumb instead of an index finger.
- ❖ **While the student is taking the QUILS, his or her screen press will not register until the narration has stopped. The adult may remind the student to wait until this point or prompt the student to touch the screen again.**



Preparing the Screening Environment

The adult should prepare the screening location and collect necessary materials before the screening. This will avoid distraction for the student as the adult will be all ready to go.

Screening Location Young children are notoriously distractible. For this reason, try to position students so that they are not watching the classroom while they are

taking the screener. We have found that using a corner of the classroom or going out into the hall is effective at helping students maintain their focus. Take the following steps to establish a screening environment that promotes optimal performance from each student:

- ❖ Ensure that the space is quiet and free from major distractions.
- ❖ Use a screening location with a strong Wi-Fi connection (a minimum of 10–15 MB/s downloading speed). To test this, use the Demo Mode on the Home page. This will allow you to determine if your Wi-Fi is strong enough without starting a screening.
- ❖ Prepare the screener on the selected device (e.g., tablet or touchscreen computer) and create the Student Record with the appropriate information for the students *prior* to beginning the session.
- ❖ If using a device that has both a touchscreen and mouse capacity, be sure to disconnect the mouse prior to starting the screening to hide the cursor. If the mouse cannot be disconnected, move the cursor off the screen so that the cursor does not distract the student during the screening.
- ❖ Place the device immediately in front of the student on a stable surface cleared of all distractions so the device is within the student’s easy reach and at a good viewing angle.
- ❖ Sit at an angle to the student and device so that both the student and the device are visible.
- ❖ Test the device’s volume prior to beginning the session to ensure the audio is loud enough for the child to hear the verbal prompts during the screening.
- ❖ Ensure that the audio cannot be heard by other students who have not been screened yet.
- ❖ Be sure to have exited out of or muted other programs and web sites on your device so they will not interfere with the screener.

Headphones (Optional) If potential noises interfere with the session, the student may use a pair of child-size headphones. Attach a headphone splitter to the device and plug in a pair of child-size headphones for the student and adult-size headphones for the adult. The adult should test the audio prior to assessing a student to ensure the volume is at an appropriate level.

When a Touchscreen Device Is Not Available The QUILS can be administered on devices that do not have touchscreens. Administration instructions are the same as for touchscreen devices, but the adult needs to be sure that the student can use the mouse to indicate an answer. Note, though, that the norming data for the QUILS were collected on touchscreen devices, so the experience of completing the screening by mouse may affect the results, especially if the student is an inexperienced mouse user.

Setting Up a Student Record

Before having a student take the QUILS, an adult must set up a Student Record that will maintain the Student Profile, completed screenings, and reports of results. The Student Profile includes required and optional fields for demographic data about the student, his or her family, and the school or child care setting. Refer to Chapter 5 for more details on the Student Record.

Conducting a Screening



Once the Student Record has been created, the child's screening session can begin. General instructions described below in Observing the Student Doing the Practice Items should be provided immediately before the screening starts and during the three practice items.

No additional instructions are necessary for any of the other items within the QUILS. Some students, however, may need additional prompting as they progress through the screener (see the provided script suggestions); use your own judgment to determine whether a student needs more or less feedback (see Additional Recommendations for Working with Children in This Age Group for more information).

Bring the student to the selected screening location. The student should be comfortably seated within easy reach of the device on which he or she will take the QUILS so that the student can press the screen with sufficient pressure to record responses.

Before beginning the screening:

1. Introduce yourself and be friendly. Ask, *"Hi, how are you today?"* or *"Do you like computer games?"*
2. Next, tell the student, *"Today, we're going to play some games on my special computer [tablet]! Are you ready?"*
3. If necessary, have the child practice touching the screen before beginning the screening. *"For my game, you're going to see some pictures and movies on the screen, and you'll touch one of them! See, you touch the screen just like this"* (demonstrate, touching the screen in an area that will not advance to the start of the QUILS; encourage the child to try). *"That's it! Now you're ready to play!"*

If this is the first time you are screening a student, go to the Student Record and click the "Start Screening" button at the top of the page. Selecting the "Start New Screening" button will open the start page of the screener. The student listens to the instructions provided by the software. See the provided scripts above for additional guidance the adult should provide.

If you are beginning a screening for a student who has been screened previously, you can also go to Your Latest Screenings table on the Start Screening page. This table lists your last 10 screenings. If you want to screen a student who is not listed in the table, select the "Access All Student Records" button to be redirected to your current list of all active Student Records.

If you are resuming a screening in progress, you can either go to the Student Record page, scroll down to the Screenings section, and press "Continue Screening" or go to Your Latest Screenings table. Click "Continue Screening" for the desired student. If you choose to "Continue Screening" from either location, the screener will resume automatically at the beginning of the last attempted item.

Observing the Student Doing the Practice Items

Prior to beginning the screening and immediately following the general instructions, the child views three practice items that are not scored as part of the screening. These items provide familiarization with the touchscreen computer or tablet and provide training in the general format of the screening. The practice items are designed to familiarize the student with the screening protocol. The child hears standardized prerecorded instructions. It is crucial that the child understands how to make a selection on the touchscreen during these practice items. This ensures that scores during

the screening will reflect the child’s language competence. The adult supervising the screening should follow these guidelines to administer the practice items:

1. For Item 1, the narration says, “Let’s begin. When I say ‘Find the teacher,’ choose one of these pictures.” (The four pictures, the target and the three foils, will flash.) “Find the teacher.” Make sure the child is touching a selection for his or her response on the screen, but do not provide any hints about the correct answer. If the child is not responding, use general gestures across the bottom of the touchscreen to encourage the child while saying, “Touch one of these pictures!”
2. For Item 2, the narration says, “When I say ‘Find eating,’ choose one of these pictures.” (The target picture and foils will flash.) “Find eating.” Again, ensure the student is selecting his or her response on the screen without providing hints about the correct answer. You can say, “Touch one of these pictures!” as you gesture.
3. For Item 3, a single picture appears on the screen and the narrator says, “Look at this picture. I’m going to ask a question about it.” The target and two foils then appear below the reference scene and the narrator says, “When I ask, ‘Who is feeding the baby?’ choose one of these pictures.” (The smaller target picture and foils flash.)
 - ❖ Make sure the student understands that he or she needs to touch one of the smaller pictures below the large picture to respond.
 - ❖ If the student continues to press the big picture instead of one of the smaller pictures at the bottom, give the student a longer explanation: “Look at the big picture and listen to the question. Then, pick one of the little pictures as your answer.” That way the student will understand that the big picture is for looking at while the question is being asked and the smaller target and foils are for choosing an answer. Gesture across the three smaller answer choices to encourage the student to touch one of them.

After the practice items, the adult should not interfere with the program as it progresses except to pause or exit the QUILS if necessary.

Giving the Screener

The actual screening starts when the student views and listens to the QUILS items, as described in the area, type, and item explanations in Chapters 1 and 4. After an item is presented and the accompanying audio is completed, the student should respond to the question by touching one of the options on the screen.



The software is configured so that the student’s response is not registered until the audio is finished. The software is also configured so that a second touch on the screen will not register and a child cannot change his or her response. Once a response is made, the outline around the picture turns red and the screener moves on to the next question or directive.

A yellow border surrounds each option, and when an option is selected, the border turns red and the test advances to the next item. If a student does not select an option within 20 seconds following the completion of the auditory prompt, the prompt is repeated. If the student fails to select a response after an additional 15 seconds, the screener advances to the next item. The student is not penalized in any way, and the screener does not make the student feel as if he or she missed an item. The QUILS software automatically moves through the types (2–5 items in each) until the screening is completed. The software presents brief animated scenes at intervals throughout to offer a fun break from responding to the items. These clever animations also serve as reinforcers to encourage the student to continue until the screening is completed.

Interacting with Children During Screening without Influencing Their Responses

The screener is designed to be given automatically so that the narration and data collection are uniform. For these reasons, we want to limit extra information that the adult might inadvertently provide. We also want to make sure that each child feels comfortable while taking the screener. We recommend the following:

- ❖ Be encouraging without giving clues about the right answer. It is important not to indicate whether the child answered an item correctly or incorrectly; praise the student's *effort* rather than his or her performance. Phrases adults can use occasionally after items are completed include, *"Thanks!" "Here's another one!"* and *"Wow! You're really trying hard!"*
- ❖ If a student is confused or does not select a response, do not point to one particular choice because this may indicate to the student which one is correct. Instead, gesture across the bottom of the screen, indicating all the choices, and say, *"Choose one of these answers."* Avoid spatial language such as below and down here.
- ❖ If the student says "I don't know" or asks you for the answer, just say, *"Make your best guess," "Give it a try,"* or *"What do you think?"*
- ❖ If the student touches the screen before the narration is complete, say, *"First, listen; then, touch the screen!"* or *"Wait your turn!"*
- ❖ If the student does not touch the screen, encourage by demonstrating touching an area of the screen that does not advance the QUILS to the next item. Say, *"Look, I'm touching the screen! Now you try!"*

Additional Recommendations for Working with Children in This Age Group

Some students take longer to complete the QUILS and need more adult support. You should use your own judgment to determine how much support each child requires. During the session, the student should advance through the items at his or her own pace. However, students have up to 20 seconds to respond; then, the audio will repeat the question or directive. The student has another 15 seconds to respond before the software advances to the next item. If the student needs additional encouragement to move through the screening, the adult can praise the student's effort.

- ❖ Screening should take 15–20 minutes per session. The screener progresses automatically, so the adult should not rush the student or interfere with the pace. Let the student set the pace of the interaction within the allotted time frame (35 seconds per item).
- ❖ Your goal is to help the student give his or her best and most thoughtful responses and also enjoy the experience. You should not make disapproving faces or shake your head, even when the student provides incorrect responses. You should stay positive without offering the student clues or cues.
- ❖ You should only refer to the screener as a "game" rather than as a "test." This terminology is actually true from the student's perspective.

- ❖ You should stick to the scripts and instructions as closely as possible.
- ❖ You should avoid saying “Good!” “That’s right!” or any other statement after an item that may influence the student’s performance. It is okay to say “Okay!” “Thanks!” or “Alright!” to keep screening sessions moving.
- ❖ If a student’s attention is drifting, you can say, “I need your eyes!” or “I need your ears!” while pointing at the student’s eyes or ears, bringing the student’s focus back to the screen.
- ❖ If the student needs a longer break, you can exit the QUILS and try a brief activity (e.g., “Show me how many jumping jacks you can do!” “Let’s hop like a bunny!”) until the student can focus again.
- ❖ If a student has to stop partway through a screening, the screener will resume at the beginning of the item where the student left off if you have used the “Exit” button to stop the screener. You may need to pause or exit the QUILS if a student needs a bathroom break or for other environmental reasons (e.g., a fire drill).

Screening Across Multiple Sessions



The adult supervising the screening should use his or her judgment about whether the student has become too disengaged from the task; if this is the case, the QUILS can be exited and resumed during another screening session. Sessions can be resumed within 2 weeks of the initial screening date. After 2 weeks, the student will need to start a new session from the beginning of the screener.



7

Scoring, Reporting, and Follow-Up

This chapter describes the scoring of the QUILS and the reports that can be generated from those scores. The QUILS can automatically generate scores once the user selects which report to run. This chapter also offers suggestions for follow-up depending on the student's results.

Scores

The QUILS generates area and overall raw scores, standard scores, and percentile ranks. These scores are described below.

Area and Overall Raw Scores

The QUILS automatically generates one raw score for each area of the QUILS: Vocabulary, Syntax, and Process. Area raw scores are derived by summing the number of items the student answered correctly on the four types within each area. A correct answer to each item in the area earns a raw score of 1 point, with a total possible area raw score of 16. Note that the items in the Noun Learning and Adjective Learning types have two parts, both of which must be answered correctly for the student to receive credit. Across the three areas, the total possible raw score is 48 (i.e., 16 for each area). The raw scores are converted to standard scores and percentile ranks and are only included on the Student Detailed Report.

Standard Scores

The QUILS converts the area and overall raw scores into standard scores. Standard scores make the assumption that scores at a given age (e.g., 4;0–4;11 years) are spread around a mean, or average, of 100. (For further technical details on how standard scores are derived, see Chapter 9.) There are three sets of standard scores—for 3-, 4-, and 5-year-olds—for both the area scores and the overall score. Most children will have scores close to this mean for their age, with only a few exceptional children receiving very low or very high scores. Using the standard scores allows the teacher or administrator to tell if a child's performance on the QUILS falls within the typically developing range for his or her age or is markedly different. The QUILS is most concerned with identifying children whose language is in the low range so that the students can be referred for follow-up assessment and then, if necessary, receive intervention services.

Percentile Ranks

Percentile ranks are another way that a student’s performance can be profiled. The QUILS automatically converts the standard scores to percentile ranks. The question answered is “When compared to age peers, where does the child’s score fall?” For example, the child could score in the lowest 10%, or right in the middle at 50%, or in the highest percentile at 99%. The percentile rank represents the percentage of children the child is ranked above.

Standardization Sample

The standard scores and the percentile ranks used in the QUILS are based on results collected from the standardization sample, that is, the large group of 3-, 4-, and 5-year-olds who completed the QUILS during the development team’s Second Item Tryout. This sample was designed to be representative (i.e., a good reflection) of the U.S. population from ages 3 through 5 years, including children of both genders and many racial groups and ethnicities, as well as children whose families represent the whole spectrum of education and income levels. Two caveats about the standardization sample are worth noting, however. The students in the sample were all in preschool, child care, or kindergarten, and they all were almost completely monolingual in English. (For more information about the standardization sample, see Chapter 9.)

Cut Scores

For each overall score and area score, a cutoff was identified to establish a point at which students should be referred for follow-up assessment. The 25th percentile rank has been identified as that cut score based on the development team’s clinical judgment and experience. The cut scores should not be used for diagnosis but as an indicator that the student should be referred for follow-up evaluation with more comprehensive assessments. If a school or program wishes to use a different point in the percentile ranks as guidance for determining follow-up evaluation, Tables 9A.1–9A.4 show the range of standard scores and percentile ranks by age.

Reports



The QUILS web site provides a number of report options. Instructions for generating these reports are provided in Chapter 5. This chapter describes the purpose of each report. Reports can be accessed by either clicking on the Reports page from the navigation bar on the QUILS web site or by selecting the button for the individual report options on a Student Record.

Student Reports

In the case of reporting on individual students, the QUILS web site can produce several reports about a student’s single screening or across multiple screenings for administrators and teachers, including a Student Brief Report, a Student Detailed Report, and a Status Over Time Report.

Student Brief Report The Student Brief Report is a summary of the student's QUILS results. It provides standard scores and percentile ranks for the QUILS overall and each area. Percentile ranks are graphed for easy visual comparison. The final section includes a concise statement of the student's performance and offers a follow-up recommendation.

Student Detailed Report The Student Detailed Report recaps the information from the Student Brief Report and provides a detailed breakdown of the QUILS items. For each item, the report displays the area and type in which it belongs, identifies the correct answer, and shows the student's chosen answer. Color-coding facilitates a quick comparison of the student's answers to the correct answers. The Student Detailed Report allows a teacher or other professional to analyze in depth where the student may benefit from additional support. This report provides a detailed recommendation based on the student's performance in each area.

Status Over Time Report The Status Over Time Report allows a comparison of two screenings of the same student. For the student's overall and individual area scores and percentile ranks, this report displays the student's results relative to the age norms for the two screenings. The QUILS developers recommend screening students annually. At this stage, the QUILS has not been specifically designed to be used as a progress monitoring tool. It will only provide an overview of the student's language progress at the time of the two screenings.

Parent Report

The Parent Report provides an overview of the student's individual screening, including the percentile rank. The Parent Report has been written at an easy-to-understand reading level and the graphical presentation for this report is designed to clearly illustrate the student's screening results for parents and other primary caregivers. The brief note at the end of the report refers the parent or caregiver to the teacher to provide additional information about follow-up. The Parent Report indicates that there are resources available on the QUILS web site, including activities that the teacher and parents can use. Teachers can select from these resources to provide helpful guidance to family members.

Group Reports

Teachers can select which students to include in a Group Report and it will automatically include the last screening for each student selected within the previous 12-month period. Each report is described briefly.

Group Status Report The Group Status Report helps the teacher monitor which students have or have not completed the QUILS. Teachers can select any set of students they would like to include in the Group Status Report. For each student within that set, the Group Status Report will display the status of the most recent screening within the past 12 months: Complete, In Progress, In Progress – Expired, or Not Started. Complete means that the student successfully finished the screening and results were generated. In Progress means a student started a screening within the past 2 weeks that has not yet been finished, but time remains to do so. In Progress – Expired means a student had started a screening but more than 2 weeks have elapsed since the

screening was started. Not Started means no screening at any level of completion has been recorded.

Group Overview Report The Group Overview Report provides a group snapshot of students' performance in each area of the QUILS as well as overall. With this information, teachers can make planning decisions based on students' language comprehension skills. For this report, teachers can select any group of students they would like to include. The Group Overview Report displays a grid of students' overall percentile ranks for each area score and for their overall score.

Follow-Up

The purpose of the QUILS is to identify students who may need follow-up evaluation or who will benefit from additional activities, either at home or in the classroom.

Referral for Follow-Up Assessment

Students who do not score above the cutoffs should be referred to a speech-language pathologist or other expert for follow-up evaluation with a comprehensive language assessment. In the QUILS developers' best judgment based on the research literature and clinical experience, students who perform at less than the 25th percentile overall or in both Product areas (Vocabulary and Syntax) or who are underperforming in their ability to learn new language items (Process area) are likely to have difficulty in their school readiness as well as later school success. Therefore, the developers offer the following guidelines for when to refer for follow-up assessment:

- ❖ Students with an *overall percentile rank below 25* should be referred for a follow-up evaluation. Below the 25th percentile rank means a percentile rank of 24.99 or below.
- ❖ Students with a *percentile rank below 25 in the Process area* (regardless of the scores in the Vocabulary and Syntax areas) should be referred for a follow-up evaluation.
- ❖ Students with *percentile ranks below 25 in both the Vocabulary and the Syntax areas* (regardless of the score in the Process area) should be referred for a follow-up evaluation.

Rescreening

No screening tool is perfect in its predictions. For that reason, with young children it may be advantageous for schools to screen again a year later, even if the student's score is over the cutoff. Programs may screen more frequently, but the QUILS is not designed to be a progress monitoring tool. Students below the cutoffs should not be rescreened with the QUILS but should be referred for evaluation (as described previously).

Enriching Students' Language Environments

Language is the single best predictor of school readiness and of school success (Hoff, 2013). Language scores at kindergarten predict math and literacy outcomes not only at kindergarten but also at third and fifth grade. Research also suggests that

language can be improved in school settings (Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002; Vernon-Feagans, Bratsch-Hines, & Family Life Project Key Investigators, 2013); yet, despite clear evidence that language is central to success for all children—monolingual and dual language learners alike—only 19% of the language used in early childhood classrooms is high quality (Dickinson, Hofer, Barnes, & Grifenhagen, 2014). Early childhood classrooms must enhance the amount and quality of the language interactions that go on throughout the school day.

Language, of course, is essential for learning to read, and language deficiencies are one of the main sources of the third-grade reading slump that many children experience (Fiester, 2010; Goodwin, 2011). During this grade, learning to read turns into reading to learn. If students do not have the language they need to understand the vocabulary and sentence structure they encounter in texts, they will not be able to learn from them (Chall, 1983).

Classrooms need to offer students more opportunities to have conversations with teachers and their peers and learn how to use language to control their behavior, express their feelings, describe objects and events, and discuss ideas. The following six principles, derived from psychological and educational research, capture the factors that help children learn language (Harris, Golinkoff, & Hirsh-Pasek, 2011). These principles are recommended for classrooms with young children to guide how adults use language when interacting with the students.

1. *Children learn what they hear most—frequency matters.* As Neuman and Dwyer (2009) suggested, “Talk may be cheap but it is priceless for young developing minds” (p. 384). The amount of language exposure has long-range consequences for later language and reading levels (Clarke, Henderson, & Truelove, 2010; Marchman & Fernald, 2008). This relationship between adult input and child output not only appears in home environments but also in studies of child care and early schooling (Hoff, 2006; NICHD ECCRN, 2000, 2002, 2005).
2. *Children learn words for things and events that interest them.* Lois Bloom (2000) wrote that “Language learning is enhanced when the words a child hears bear upon and are pertinent to the objects of engagement, interest and feelings” (p. 19). In other words, adults should tailor their language to children’s interests.
3. *Interactive and responsive environments build language learning.* Language learning requires sensitive and responsive conversations with children. Adults who take turns in interactions with young children, share periods of joint focus, and express positive affect provide children with the scaffolding needed to facilitate language and cognitive growth (e.g., Bronfenbrenner & Morris, 1998; Landry, Smith, Swank, Assel, & Vellet, 2001). As Dickinson (personal communication) said, adults should “Strive for 5” back-and-forth turns when talking with young children.
4. *Children learn best in meaningful contexts.* Sparking a child’s interest is often the first step in meaning making. People learn best when information is presented in integrated contexts rather than as a set of isolated facts (Bartlett, 1932; Bruner, Goodnow, & Austin, 1972). Words connected in a story are easier to remember than the same list of words presented without context.
5. *Children need to hear diverse examples of words and language structure.* The amount and diversity of talk addressed to children matters for fostering earlier and richer language outcomes in terms of both vocabulary and grammar (Tamis-LeMonda, Bornstein, & Baumwell, 2001). This is true for what takes place in the home and in the classroom as well (Huttenlocher et al., 2002).

6. *Vocabulary and grammatical development are reciprocal processes.* Vocabulary and grammar are not divorced; they feed one another. Knowing syntax helps children learn new words. For example, they can use the position in which a new word appears in the sentence (nouns follow articles like *the* and *a*) and the endings on the words (e.g., /-ed/ on a new word suggests that the word is a verb) to facilitate learning.

Many curricula offer language enrichment. Rather than endorsing certain curricula, the QUILS developers recommend that adults structure settings for young children in light of these principles to best grow children's language. Talking with children—not *at* them—and encouraging children to use language to talk about their ideas with adults are key ways to help children's language expand in important ways.

Students with Vocabulary and Syntax Weaknesses

These principles of language learning are useful for all students, including students who are dual language learners. However, students with more severe language disorders in one or more of the QUILS areas will need additional intervention. In addition to individual or classroom-based services, these students may benefit from targeted computer-delivered interventions that they can use outside of the times when they are with their speech-language pathologist (e.g., Wilson, Fox, & Pascoe, 2011; Wilson & Pascoe, 2010).



8

The QUILS in Practice

Interpreting Results

Through Five Case Examples

This chapter presents five cases of children who completed the QUILS with different results. Their stories illustrate the differences between the scores of a typically developing child versus those of a child who should be recommended for follow-up assessment. These are actual cases drawn from students in the QUILS standardization study, some of whom may have had language issues. (Their identities are masked for privacy protection.) *Note:* All family income levels were identified based on the volunteered self-report of the mother's educational level.

Case 1: Screening Indicates Typical Development

Terrence is a 4-year-old (4;11) boy of mixed racial heritage. He is non-Hispanic and lives in a household with five other siblings and two parents. The family's income level was identified as low SES (based on the mother having achieved a high school education). Terrence attends an English-speaking preschool, and no languages other than English are spoken in the home. Terrence's QUILS results are shown in Table 8.1 as well as his Student Brief Report in Figure 8.1.

As displayed in Table 8.1, Terrence showed very good skills in all three areas of the QUILS: Vocabulary, Syntax, and Process. He scored above the 83rd percentile rank overall compared to other 4-year-olds. Given this profile, there is no need for follow-up language assessment.

Table 8.1. Terrence's profile on the QUILS

Area	Standard score	Percentile rank*
Vocabulary	105	73.4
Syntax	108	76.0
Process	115	90.9
Overall	108	83.8

*Compared to age peers.



Student Brief Report

Student Information

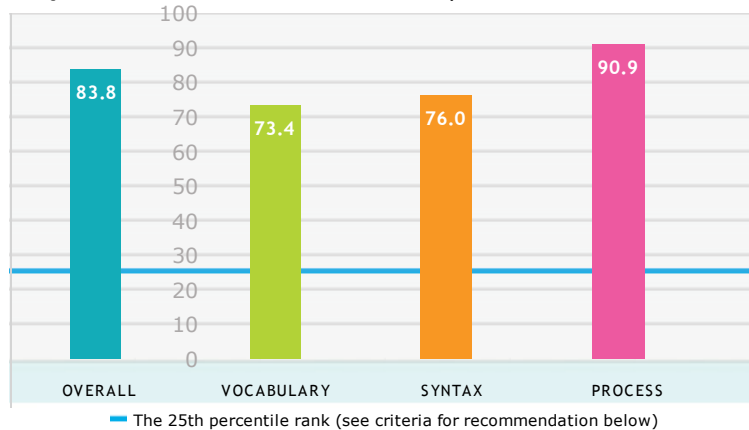
Student Name: Terrence A.
Student ID: 121214

Date of Birth: 03/10/2012
Date of Screening: 02/12/2017
Age at Screening: 4 years

Strong language skills are essential for every student's success in school and in life. The QUILS measures a student's emerging abilities in Vocabulary, Syntax, and Process and offers an overall rating. These results are expressed as standard scores and percentile ranks. (See Chapter 9 of the QUILS User's Manual for more information.)

Terrence A.'s Performance

On 02/12/2017, Terrence A.'s language skills were screened using the Quick Interactive Language Screener™ (QUILS™). The overall percentile rank of 83.8 means that Terrence A. scored as well as or better than 83.8% of 4-year-olds in the standardization sample. In addition to the overall results, standard scores and percentile ranks for each of the three areas of the QUILS were calculated. Based on these calculations, a recommendation is listed below for Terrence A.'s results.



Overall		Vocabulary		Syntax		Process	
Standard Score	Percentile Rank	Standard Score	Percentile Rank	Standard Score	Percentile Rank	Standard Score	Percentile Rank
108	83.8	105	73.4	108	76.0	115	90.9

Vocabulary area asks about words students use or understand, including ordinary things (nouns), actions (verbs), prepositions, and conjunctions.
Syntax area asks about structure of sentences including *wh*-questions, tense markers (past tense), prepositional phrases, and embedded clauses.
Process area asks about learning new words (verbs, nouns, and adjectives) and about how children use syntax, such as converting active sentences to passive sentences.

Recommendation:

Based on Terrence A.'s performance on the QUILS, Terrence A.'s language comprehension appears to be within the typical range relative to age, and no follow-up evaluation is recommended at this time.

Criteria for recommendation:

- Students with an overall percentile rank below 25 should be referred for follow-up evaluation.
- Students with a percentile rank below 25 in the Process area (regardless of the Vocabulary and Syntax scores) should be referred for follow-up evaluation.
- Students with percentile ranks below 25 in both Vocabulary and Syntax (regardless of the Process score) should be referred for follow-up evaluation.

Figure 8.1. Screenshot of Terrence's (Case 1) QUILS results from the Student Brief Report indicate typical development.

Case 2: Screening Reveals a Mixed Profile

Amelia is a 3-year-old (3;6) African American girl living with four other siblings and three adults in an English-speaking family with no significant exposure to other languages. The family is from a low SES background (based on the mother having achieved a high school education). Amelia attends an English-speaking preschool. Her profile of language comprehension on the QUILS is shown in Table 8.2 as well as her Student Brief Report in Figure 8.2.

Overall, Amelia's language is in the low-normal range, but her profile is very uneven. Her Vocabulary score is surprisingly weak—less than the 7th percentile—especially relative to her score at a typical level in the Syntax area. Her ability to pick up and extend new words and structures (Process), however, is in the typical range for her age. The recommendation would be to wait 12 months and rescreen because her language skills and new exposure to preschool may raise her Vocabulary score into the typical range. If not, then follow-up evaluation would be recommended at that time.

Table 8.2. Amelia's profile on the QUILS

Area	Standard score	Percentile rank*
Vocabulary	70	6.9
Syntax	101	61.5
Process	100	51.5
Overall	91	36.6

*Compared to age peers.



Student Brief Report

Student Information

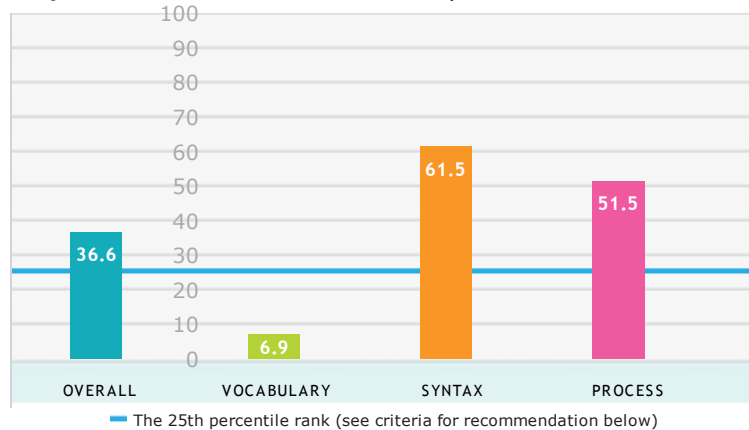
Student Name: Amelia B.
Student ID: 264

Date of Birth: 08/10/2013
Date of Screening: 02/12/2017
Age at Screening: 3 years

Strong language skills are essential for every student's success in school and in life. The QUILS measures a student's emerging abilities in Vocabulary, Syntax, and Process and offers an overall rating. These results are expressed as standard scores and percentile ranks. (See Chapter 9 of the QUILS User's Manual for more information.)

Amelia B.'s Performance

On 02/12/2017, Amelia B.'s language skills were screened using the Quick Interactive Language Screener™ (QUILS™). The overall percentile rank of 36.6 means that Amelia B. scored as well as or better than 36.6% of 3-year-olds in the standardization sample. In addition to the overall results, standard scores and percentile ranks for each of the three areas of the QUILS were calculated. Based on these calculations, a recommendation is listed below for Amelia B.'s results.



Overall		Vocabulary		Syntax		Process	
Standard Score	Percentile Rank	Standard Score	Percentile Rank	Standard Score	Percentile Rank	Standard Score	Percentile Rank
91	36.6	70	6.9	101	61.5	100	51.5

Vocabulary area asks about words students use or understand, including ordinary things (nouns), actions (verbs), prepositions, and conjunctions.
Syntax area asks about structure of sentences including *wh*-questions, tense markers (past tense), prepositional phrases, and embedded clauses.
Process area asks about learning new words (verbs, nouns, and adjectives) and about how children use syntax, such as converting active sentences to passive sentences.

Recommendation:

Based on Amelia B.'s performance on the QUILS, Amelia B.'s language comprehension appears to be within the typical range relative to age, and no follow-up evaluation is recommended at this time. Amelia B. may benefit from specific activities in Vocabulary.

Criteria for recommendation:

- Students with an overall percentile rank below 25 should be referred for follow-up evaluation.
- Students with a percentile rank below 25 in the Process area (regardless of the Vocabulary and Syntax scores) should be referred for follow-up evaluation.
- Students with percentile ranks below 25 in both Vocabulary and Syntax (regardless of the Process score) should be referred for follow-up evaluation.

Figure 8.2. Screenshot of Amelia's (Case 2) QUILS results from the Student Brief Report highlighting how an uneven or mixed profile could influence resulting recommendations.

Case 3: Screening Indicates Atypical Development

Brandon is a 3-year-old (3;9) African American boy of non-Hispanic heritage living in a household with one sibling and two parents. The family was identified as low SES (based on the mother having achieved a high school education). Brandon hears no languages other than English in the home and attends an English-speaking preschool. Brandon's QUILS results are shown in Table 8.3 as well as his Student Brief Report in Figure 8.3.

Brandon provides an interesting profile, one that should send up red flags. Although his overall score as well as his standard scores in the Vocabulary and Syntax areas are well within normal range, he is very weak in learning new words and structures, scoring in the lowest possible percentile rank in the Process area. Remarkably, he did not get a single item correct in the Process domain, but consistently chose the wrong answers. In addition to the QUILS, he was one of the children from the standardization study who also took the Auditory Comprehension Subtest of the PLS-5 (Zimmerman et al., 2011) to test for concurrent validity (see Chapter 9), and his score on the PLS-5 was only in the 12th percentile for his age. Brandon's case makes clear that the Process area adds something distinctive to a student's profile of skills, and that is why it is recommended that a child who scores poorly in the Process area alone should be given follow-up evaluation.

Table 8.3. Brandon's profile on the QUILS

Area	Standard score	Percentile rank*
Vocabulary	105	68.5
Syntax	96	40.8
Process	73	5.4
Overall	92	39.4

*Compared to age peers.



Student Brief Report

Student Information

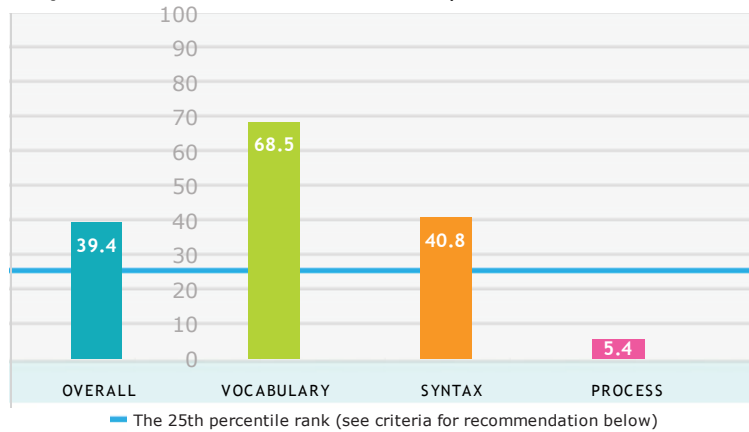
Student Name: Brandon C.
Student ID: 850

Date of Birth: 05/08/2013
Date of Screening: 02/12/2017
Age at Screening: 3 years

Strong language skills are essential for every student's success in school and in life. The QUILS measures a student's emerging abilities in Vocabulary, Syntax, and Process and offers an overall rating. These results are expressed as standard scores and percentile ranks. (See Chapter 9 of the QUILS User's Manual for more information.)

Brandon C.'s Performance

On 02/12/2017, Brandon C.'s language skills were screened using the Quick Interactive Language Screener™ (QUILS™). The overall percentile rank of 39.4 means that Brandon C. scored as well as or better than 39.4% of 3-year-olds in the standardization sample. In addition to the overall results, standard scores and percentile ranks for each of the three areas of the QUILS were calculated. Based on these calculations, a recommendation is listed below for Brandon C.'s results.



Overall		Vocabulary		Syntax		Process	
Standard Score	Percentile Rank	Standard Score	Percentile Rank	Standard Score	Percentile Rank	Standard Score	Percentile Rank
92	39.4	105	68.5	96	40.8	73	5.4

Vocabulary area asks about words students use or understand, including ordinary things (nouns), actions (verbs), prepositions, and conjunctions. **Syntax area** asks about structure of sentences including *wh*-questions, tense markers (past tense), prepositional phrases, and embedded clauses. **Process area** asks about learning new words (verbs, nouns, and adjectives) and about how children use syntax, such as converting active sentences to passive sentences.

Recommendation:

Based on Brandon C.'s performance on the QUILS, Brandon C.'s language comprehension appears to be outside the typical range relative to age, and follow-up evaluation is recommended at this time. Brandon C. may benefit from specific activities in Process.

Criteria for recommendation:

- Students with an overall percentile rank below 25 should be referred for follow-up evaluation.
- Students with a percentile rank below 25 in the Process area (regardless of the Vocabulary and Syntax scores) should be referred for follow-up evaluation.
- Students with percentile ranks below 25 in both Vocabulary and Syntax (regardless of the Process score) should be referred for follow-up evaluation.

Figure 8.3. Screenshot of Brandon's (Case 3) QUILS results from the Student Brief Report indicate atypical development in the Process area (learning new words and structures). Recommendations include follow-up evaluation.

Case 4: Screening Indicates Atypical Development

Emma is a 3-year-old (3;6) girl living with both her parents and attending an English-speaking low-income Head Start program. She is of Hispanic heritage but has no exposure to languages other than English and is monolingual. Emma's QUILS results are depicted in Table 8.4 as well as her Student Brief Report in Figure 8.4.

Emma's overall standard score of 88 places her in the 28th percentile, just over the cutoff (25th percentile rank) recommended for follow-up assessment. However, her profile reveals that she has weak skills in both the Syntax (20th percentile) and the Vocabulary (22nd percentile) areas for her age group. Despite performing in the average range (50th percentile) in the Process area with an overall score above the cutoff, her poor performance on *both* the Vocabulary and Syntax areas places her in the category of risk. The recommendation would be for follow-up evaluation by a speech-language pathologist.

Table 8.4. Emma's profile on the QUILS

Area	Standard score	Percentile rank*
Vocabulary	85	21.5
Syntax	83	20.0
Process	100	51.5
Overall	88	27.7

*Compared to age peers.



Student Brief Report

Student Information

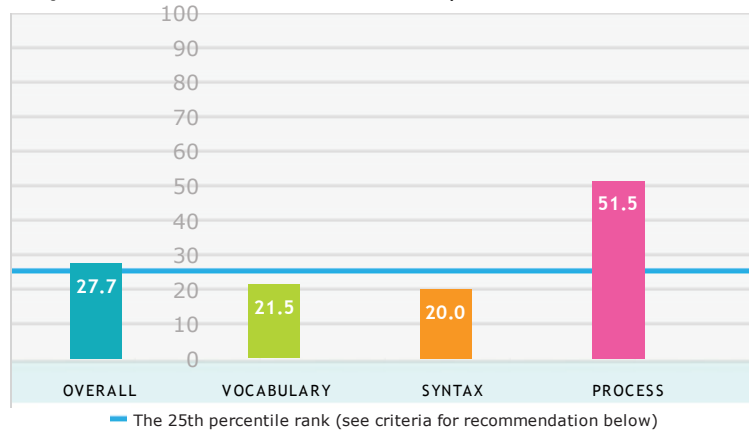
Student Name: Emma D.
Student ID: 434

Date of Birth: 08/05/2013
Date of Screening: 02/12/2017
Age at Screening: 3 years

Strong language skills are essential for every student's success in school and in life. The QUILS measures a student's emerging abilities in Vocabulary, Syntax, and Process and offers an overall rating. These results are expressed as standard scores and percentile ranks. (See Chapter 9 of the QUILS User's Manual for more information.)

Emma D.'s Performance

On 02/12/2017, Emma D.'s language skills were screened using the Quick Interactive Language Screener™ (QUILS™). The overall percentile rank of 27.7 means that Emma D. scored as well as or better than 27.7% of 3-year-olds in the standardization sample. In addition to the overall results, standard scores and percentile ranks for each of the three areas of the QUILS were calculated. Based on these calculations, a recommendation is listed below for Emma D.'s results.



Overall		Vocabulary		Syntax		Process	
Standard Score	Percentile Rank	Standard Score	Percentile Rank	Standard Score	Percentile Rank	Standard Score	Percentile Rank
88	27.7	85	21.5	83	20.0	100	51.5

Vocabulary area asks about words students use or understand, including ordinary things (nouns), actions (verbs), prepositions, and conjunctions.
Syntax area asks about structure of sentences including *wh*-questions, tense markers (past tense), prepositional phrases, and embedded clauses.
Process area asks about learning new words (verbs, nouns, and adjectives) and about how children use syntax, such as converting active sentences to passive sentences.

Recommendation:

Based on Emma D.'s performance on the QUILS, Emma D.'s language comprehension appears to be outside the typical range relative to age, and follow-up evaluation is recommended at this time. Emma D. may benefit from specific activities in Vocabulary and Syntax.

Criteria for recommendation:

- Students with an overall percentile rank below 25 should be referred for follow-up evaluation.
- Students with a percentile rank below 25 in the Process area (regardless of the Vocabulary and Syntax scores) should be referred for follow-up evaluation.
- Students with percentile ranks below 25 in both Vocabulary and Syntax (regardless of the Process score) should be referred for follow-up evaluation.

Figure 8.4. Screenshot of Emma's (Case 4) QUILS results from the Student Brief Report indicate atypical development in Syntax and Vocabulary. Recommendations include follow-up evaluation by a speech-language pathologist.

Case 5: Screening Reveals Possible Language Delay

Kevin is a 5-year-old (5;5) white non-Hispanic boy living in a monolingual English-speaking household with two adults and one other sibling. His family is mid-SES (based on the mother having attended college), and his mother is the primary caregiver. He attends an English-speaking preschool. Kevin's QUILS results are given in Table 8.5 as well as his Student Brief Report in Figure 8.5.

Kevin's Vocabulary score is well below the norm for his peers, being only at the 8th percentile rank compared to other 5-year-olds. His Syntax and Process scores are also poor on this screening. Figure 8.6 illustrates Kevin's profile through a sample of representative responses to the screener in all three areas.

The recommendation is that Kevin should receive a thorough diagnostic evaluation by a speech-language pathologist on the basis of this profile.

Table 8.5. Kevin's profile on the QUILS

Area	Standard score	Percentile rank*
Vocabulary	79	8.4
Syntax	85	16.0
Process	87	21.4
Overall	81	13.7

*Compared to age peers.



Student Brief Report

Student Information

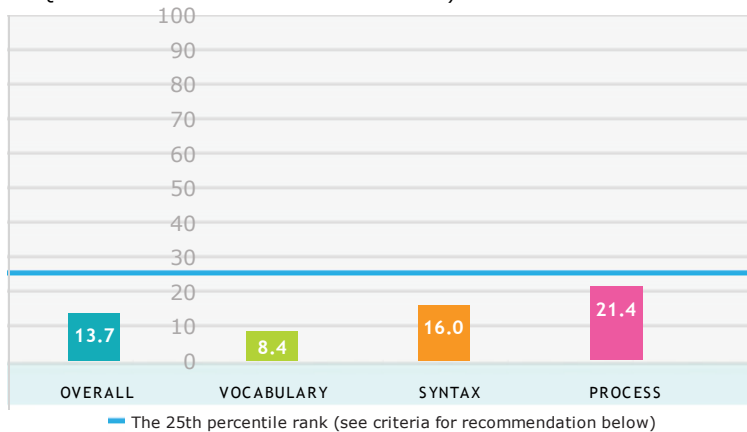
Student Name: Kevin E.
Student ID: 667

Date of Birth: 09/03/2011
Date of Screening: 02/12/2017
Age at Screening: 5 years

Strong language skills are essential for every student's success in school and in life. The QUILS measures a student's emerging abilities in Vocabulary, Syntax, and Process and offers an overall rating. These results are expressed as standard scores and percentile ranks. (See Chapter 9 of the QUILS User's Manual for more information.)

Kevin E.'s Performance

On 02/12/2017, Kevin E.'s language skills were screened using the Quick Interactive Language Screener™ (QUILS™). The overall percentile rank of 13.7 means that Kevin E. scored as well as or better than 13.7% of 5-year-olds in the standardization sample. In addition to the overall results, standard scores and percentile ranks for each of the three areas of the QUILS were calculated. Based on these calculations, a recommendation is listed below for Kevin E.'s results.



Overall		Vocabulary		Syntax		Process	
Standard Score	Percentile Rank	Standard Score	Percentile Rank	Standard Score	Percentile Rank	Standard Score	Percentile Rank
81	13.7	79	8.4	85	16.0	87	21.4

Vocabulary area asks about words students use or understand, including ordinary things (nouns), actions (verbs), prepositions, and conjunctions.
Syntax area asks about structure of sentences including *wh*-questions, tense markers (past tense), prepositional phrases, and embedded clauses.
Process area asks about learning new words (verbs, nouns, and adjectives) and about how children use syntax, such as converting active sentences to passive sentences.

Recommendation:

Based on Kevin E.'s performance on the QUILS, Kevin E.'s language comprehension appears to be outside the typical range relative to age, and follow-up evaluation is recommended at this time. Kevin E. may benefit from specific activities in Vocabulary, Syntax, and Process.

Criteria for recommendation:

- Students with an overall percentile rank below 25 should be referred for follow-up evaluation.
- Students with a percentile rank below 25 in the Process area (regardless of the Vocabulary and Syntax scores) should be referred for follow-up evaluation.
- Students with percentile ranks below 25 in both Vocabulary and Syntax (regardless of the Process score) should be referred for follow-up evaluation.

Figure 8.5. Screenshot of Kevin's (Case 5) QUILS results from the Student Brief Report indicate a possible language delay.

In the Syntax area, he answered none of the past tense items correctly.

Past Tense	6	Where was the boy raking the leaves?	Left side	Middle	Right side		0
	7	Where was the hat?	Yellow hat on girl	Hat in air	Empty boy's head		0
	8	Where was the girl painting the fence?	Brown fence	Girl painting fence	Fence painted white		0
	9	Where was the wheel?	Red car without wheel	Wheel	Blue car with wheel		0

In the Process area, he missed about half the items, failing to extend to new examples.

Noun Learning	32	Show me the pluff on the table.	Violin sitting on a black table	Instrument sitting on brown square table	Instrument	Bowl sitting on a round table	
		Can you show me another pluff?	String instrument	Hat sitting on a table	Instrument with teal coloring	Trumpet	0
	33	Show me the merf.	Pigeon	Goose	Tool with wheels on it	Green bird	
		Can you show me another merf?	Green bird	Animal with spikes	Green/orange bird	Brown bird	0
	34	Show me the taff.	Green circular object	Cream-colored flower with a green center	Rose	Daisy	
		Can you show me another taff?	Sunflower	Yellow flower	Blue ribbons forming an organic shape	Pink flower with a green center	0
	35	Show me the gelp with the hat.	Snowmobile	Cat wearing a blue hat	Lizard wearing a tan hat	Dog wearing a red hat	
		Can you show me another gelp?	Pig wearing a cowboy hat	Blue and yellow polka-dotted lizard	Purple animal	Horse	0

In the Vocabulary area, he did not know any simple spatial prepositions, although most 5-year-olds do.

Prepositions	36	Show me the doll is above the present.	Doll sitting on a shelf below present	Doll sitting on a shelf above present	Doll sitting behind present, on the same shelf		0
	37	Find the ball is behind the pail.	Ball is above the pail	Ball is behind the pail	Ball is below the pail		0
	38	Show me the apples are in front of the bowls.	Apples are in between bowls, but not in bowls	Apples are behind the bowls	Apples are in front of the bowls		0
	39	Find the firefighters are between the chairs.	Firefighters are between the chairs	Firefighters are in front of the chairs	Firefighters are behind the chairs		0
	40	Find the umbrella is below the swing.	Umbrella is on the swing	Umbrella is above the swing	Umbrella is below the swing		0

He missed all of the items about clause conjunctions, such as *after* and *because*.

Conjunctions	46	Who ate the food before the cat jumped on the table?	Gray cat	Tan dog	Black dog		0
	47	Who came down the slide after the school bus arrived?	School bus	Boy in a green shirt	Girl in a blue shirt		0
	48	Who picked up the cake because the baby ate it?	Mother	Boy	Baby		0

Figure 8.6. Screenshots of sample responses that could result in scores similar to Kevin's performance. Blue, bolded cells indicate the correct answer, and yellow cells indicate the student's answer. Yellow bolded cells indicate when the student chose the correct answer.

Conclusion



An individual child's QUILS scores do not occur in a vacuum: family structure, the quality of care, cultural differences, and SES are all important influences on that score. However, these case studies demonstrate that children from a range of backgrounds can do well or poorly on the screener. Clearly, all children should be encouraged to develop their full potential in language since language skill predicts so much that is important in life.



Evidence Base for the QUILS

9

Details on the Research Behind the QUILS

This chapter provides technical details on the studies conducted in the development of the QUILS. The following information is for the monolingual English version of the QUILS. A bilingual English–Spanish version of the QUILS, the QUILS: ES, has also been developed. Technical data for the QUILS: ES are reported in the User’s Manual for that version. (See www.quil screener.com for more information.)

Normative Sample

The following section describes the normative sample for the QUILS.

Inclusion Criteria

The normative sample for the QUILS included children 3 (3;0) through 5 (5;11) years old with no reported visual or hearing difficulties who were screened in their child care centers, preschools, kindergartens, and Head Start programs in Massachusetts, Pennsylvania, Delaware, Florida, and Nebraska. Children who were not dominant in a language other than English were not included in the sample. The Language Questionnaire (see Figure 6.1) was given as needed to confirm a child was sufficiently familiar with English. Since the normative sample was designed to be representative of monolingual English children in this age range in the United States, it likely includes some children who had language disorders.

Sample Composition

The final normative sample for the QUILS was made up of 415 children (216 female, 199 male). This included 130 three-year-olds, 154 four-year-olds, and 131 five-year-olds. Children’s ages ranged from 3;04 to 5;11 years ($M = 4;5$; $SD = 0;9$). For 414 children, information on socioeconomic status (SES) was provided either in the form of mothers’ self-reported educational attainment or by enrollment in a low-income child care center. (Information was not reported for one child.) The majority of the children tested were from low SES families (61.2%), and 38.6% of the children were from mid-SES families. The percentage of mid-SES families is close to the percentage reported in the 2014 U.S. census data for females age 18–39 years having an education level of an associate’s degree and above (40.6%) (see Table 9.1).

Demographic data for race were available for 43.6% of the final monolingual sample. Of those who reported this information, 57.8% were White, 31.6% were Black/African American, 8.8% were multiracial, fewer than 1% were Asian, and 1% were other races.

Table 9.1. Composition of the norming sample for the QUILS (English monolingual version)

Final norming sample	
Total <i>N</i>	415
Age	
3-year-olds: <i>n</i> (%)	130 (31.32)
4-year-olds: <i>n</i> (%)	154 (37.11)
5-year-olds: <i>n</i> (%)	131 (31.57)
Mean age (years): <i>M</i> (<i>SD</i>)	4;5 (0;9)
Gender	
Male: <i>n</i> (%)	199 (47.95)
Female: <i>n</i> (%)	216 (52.05)
SES	
Low: <i>n</i> (%)	254 (61.20)
Mid: <i>n</i> (%)	160 (38.55)
Not reported	1 (.24)

Key: SES, socioeconomic status; SD, standard deviation.

Additionally, 45.9% of parents reported whether their child was of Hispanic origin; of those who reported on it, 23.3% of children were of Hispanic origin.

Developing the Items on the QUILS

The creation of the items included on the QUILS was based on extensive review of the research on children's language development, 3 through 6 years of age (including previous work by the QUILS development team), and study of the most effective techniques to measure children's language abilities. (For more information on type development, see Chapter 3.) In addition, the development team was attentive to racial, ethnic, and cultural differences. For example, the team was mindful from the start that speakers of African American English, as well as English-proficient Hispanic children would be tested. Thus, all items included in the QUILS had to contain words or linguistic structures that would not be biased against speakers of African American English or Spanish-influenced English.

Another factor the development team kept in mind during item creation was ensuring that each item could be visually depicted in a way that young children could understand. For instance, verbs referring to mental state, such as *think* or *know*, could not be visually represented. The verbs chosen entailed visible actions. Furthermore, the characters portrayed in the QUILS show a variety of ages, races, and genders, and they are representative of a range of ability levels.

Field Testing

Field testing included the recruitment process and preparation of the sites for the First Item Tryout and the Second Item Tryout.

Recruitment Process and Preparation of Sites

The development team's three labs (at the University of Delaware, Temple University in Pennsylvania, and Smith College in Massachusetts) worked with preschools and child care centers in those areas to recruit sites for pilot testing. Researchers in other areas (Omaha, Nebraska, and Miami, Florida) recruited participants in those areas from preschools and child care centers and were trained by the development team's experienced personnel.

Screener administrators in each laboratory and in each of the satellite locations were trained using a Field Testing Guide consisting of the screening administration instructions included in this User's Manual. Administrators were shown screenshots of the software and given instructions on how to use the program to administer the screener. They practiced using the software and giving the screening instructions prior to working with children. Administrators were directed to e-mail development team staff at the main pilot testing sites with questions or problems with screening. After they completed screening a group of children, administrators sent the raw data to the development team staff at the University of Delaware for analyses.

Chapter 3 describes in detail how the QUILS was developed over the course of 5 years, covering the four main phases in the QUILS development process: 1) Item Development and pilot testing, 2) First Item Tryout, 3) Second Item Tryout, and 4) Creation of the Final Version of the QUILS. Second Item Tryout—the source of the final version of the QUILS—began in January 2014 and was completed in July 2014. This chapter briefly summarizes these phases and reports the analyses conducted in construction of the screener, its subsequent testing at laboratory and satellite sites, and its finalization. (See Chapter 3 for additional information about the item development process.)

First Item Tryout

Following conventional evidence-based practice in psychometrics (Schmeiser & Welch, 2006), the development team tried out twice the number of items to appear in the final version of the QUILS. The original 96-item screener was conducted as the First Item Tryout with 306 monolingual English-speaking preschoolers from diverse socioeconomic backgrounds in Massachusetts, Delaware, and Pennsylvania. The sample consisted of 93 three-year-olds, 118 four-year-olds, and 95 five-year-olds (see Table 9.2). Based on this first round of data collection, Rasch and DIF analyses were conducted to identify the best 60 items out of the 96 used in the First Item Tryout. The 60 items scaled with age such that, on all items, 5-year-olds showed highest performance and 3-year-olds showed lowest performance.

Second Item Tryout

After the First Item Tryout was complete and analyzed to select the best and least redundant items, a 60-item version of the screener was administered to the final sample for norming from preschools, child care centers, and Head Start programs in Massachusetts, Pennsylvania, Delaware, Florida, and Nebraska. A majority of the children tested were from low-SES families (76.8%), and the remaining children were from mid-SES families (23.2%). There were 213 three-year-olds, 315 four-year-olds, and 146 five-year-olds (see Table 9.2). There were a total of 674 children tested in the Second Item Tryout.

After completion of the Second Item Tryout, problematic items were removed following analyses similar to those from the First Item Tryout. The final QUILS consists of the best 48 items culled from the two rounds of item tryouts. Table 9.3 presents the final QUILS for monolingual English; it shows the areas, types, and items in the sequence in which the items are presented. The correct answers for all items are highlighted.

Table 9.2. Composition of First Item Tryout and Second Item Tryout sample populations

	First Item Tryout	Second Item Tryout
Total <i>N</i>	306	674
Age		
3-year-olds: <i>n</i> (%)	93 (30.39)	213 (31.60)
4-year-olds: <i>n</i> (%)	118 (38.56)	315 (46.74)
5-year-olds: <i>n</i> (%)	95 (31.05)	146 (21.66)
Mean age (years): <i>M</i> (<i>SD</i>)	4;55 (0;90)	4.47 (0;80)
Gender		
Male: <i>n</i> (%)	149 (48.69)	322 (47.77)
Female: <i>n</i> (%)	157 (51.31)	352 (52.23)
SES		
Low: <i>n</i> (%)	172 (56.21)	518 (76.82)
Mid: <i>n</i> (%)	134 (43.79)	156 (23.18)

Key: *SES*, socioeconomic status.

Validity

Validity of an instrument is examined to ensure the tool is valid for the specific purposes for which it will be used. For the QUILS, the development team examined construct validity, or whether the screener actually measures language development. This also entailed a statistical test (Cronbach alpha) of whether the items formed a coherent set. The QUILS was also assessed for convergent validity, which answers the question “Does children’s performance on the QUILS correlate with their results on other established language assessments?”

Construct Validity

Construct validity demonstrates that a test measures the abilities that it is designed to measure. One of the most important requirements for an assessment is to have construct validity. That is, the screener or assessment test must be based on phenomena that expert researchers, teachers, and other educators regard as linguistically significant and educationally meaningful for children in the age range being examined. Without adequate theoretical and empirical backing to establish construct validity, no screener or test can be considered adequate. The foundation for the construct validity of the QUILS is explained in Chapter 2, which describes the theoretical and empirical bases of item and item type selection for the QUILS.

A test must also have internal integrity; that is, the items on the test must form a coherent set that intercorrelates even though the items may vary in difficulty. To ensure this for the QUILS, an analysis called Rasch modeling was used, described later in this chapter. In seeking internal integrity, the goal is to identify which items serve the intended purpose and which items are poor at doing so or are redundant because other items test the same thing. Item response theory, tested for the QUILS using Rasch modeling, provides a way to evaluate the worth of the individual items to the test as a whole. These studies are detailed in the Rasch Analyses section.

Legend	
	Vocabulary Area
	Syntax Area
	Process Area
	Correct Answer

Table 9.3. The areas, types, items, and answers of the QUILS

Type	Item Number	Question/Directive	Position 1	Position 2	Position 3	Position 4
Wh- Questions	1	What is falling on the little girl?	Cupcakes	Mat	Little girl	
	2	Who is kissing the baby?	Baby brother	Cookie	Sister	
	3	How is the boy filling the washtub?	Dog	Hose	Boy	
	4	How is the baker roasting marshmallows?	Baker	Baker eating a marshmallow	Stick over fire	
	5	Why is the girl scattering corn?	Hens and corn	Girl	Blue shovel	
Past Tense	6	Where was the boy raking the leaves?	Left side	Middle	Right side	
	7	Where was the hat?	Yellow hat on girl	Hat in air	Empty boy's head	
	8	Where was the girl painting the fence?	Brown fence	Girl painting fence	Fence painted white	
	9	Where was the wheel?	Red car without wheel	Wheel	Blue car with wheel	
Verb Learning	10	Find the boy is meeing.	Boy running	Boy "meeing"	Boy stretching his arms	
	11	Find someone is rulking something to someone.	Man and woman interacting	Man and woman not interacting	Girl "rulking" a teddy bear to boy	
	12	Find someone is jayming something to someone.	Woman and man interacting	Man and woman not interacting	Girl "jayming" a ball to a boy	
	13	Find someone is praving something.	Girl holding a cup	Girl sitting on a basket	Boy lifting one leg	
Prepositional Phrases	14	Find the dog behind a black table.	A dog in front of a black table	A dog behind a tan table	A dog behind a black table	
	15	Find the kitten in a cup with a yellow ribbon.	Kitten in a blue cup with a yellow ribbon	Kitten outside of a blue cup	Kitten in a yellow cup	
	16	Find the girl behind a car in a white garage.	Girl in a car behind a white garage	Girl in a white garage behind a red car	Girl in a red garage behind a white car	
Converting Active to Passive	17	Which one got lumbed?	Man with glasses	Man	Woman	
	18	Which one got koobed?	Boy	Girl	Blue tools	

(continued)

Table 9.3. (continued)

Embed- ded Clauses	19	Where did Grandma tell Jack to go?	Coat rack and bowl of fruit	Navy footrest	Black TV	Jack's room
	20	What did Cowboy Bob tell Mia to do?	Mia riding her skateboard	Mia getting the hammer	Mia putting on her helmet	Mia putting on her shoes
	21	Where did Hannah tell Little Matt that Jack was?	Blue garage	Fence	Toolbox	Basketball court
	22	Where did Grandpa tell Grandma that Mia was?	Swimming pool	Garden	Mailbox	Front staircase
Nouns	23	Find the fireworks.	Boy and girl eating together	Blue flag	Fireplace	Fireworks
	24	Find the sailor.	Suitcase	Librarian	Sailor	Ocean
	25	Find the doorknob.	Doorknob	Golden key	Dust pan	Red door
Verbs	26	Who is unlocking something?	Boy splashing water	Man cooking something	Girl unlocking a lock	
	27	Who is returning?	Woman returning home	Boy singing into a microphone	Boy sweeping with a broom	
	28	Who is leaning?	Man holding his nose shut	Man leaning on a piece of wood	Woman holding a cake	
	29	Who is lugging something?	Woman lifting her suitcase	Man eating	Boy climbing a ladder	
	30	Who is weighing apples?	Man weighing apples	Girl picking apples from a tree	Woman organizing apples by color	
Noun Learning	31	Show me the blue fep.	Gold toy	Blue crayon	Blue stroller	Blue tool
		Can you show me another fep?	Blue coffee mug	Lightbulb	Green tool	Red/silver robot
	32	Show me the pluff on the table.	Violin sitting on a black table	Instrument sitting on brown square table	Instrument	Bowl sitting on a round table
		Can you show me another pluff?	String instrument	Hat sitting on a table	Instrument with teal coloring	Trumpet
	33	Show me the merf.	Pigeon	Goose	Tool with wheels on it	Green bird
		Can you show me another merf?	Green bird	Animal with spikes	Green/orange bird	Brown bird
	34	Show me the taff.	Green circular object	Cream-colored flower with a green center	Rose	Daisy
		Can you show me another taff?	Sunflower	Yellow flower	Blue ribbon forming an organic shape	Pink flower with a green center
	35	Show me the gelp with the hat.	Snowmobile	Cat wearing a blue hat	A lizard wearing a tan hat	Dog wearing a red hat
		Can you show me another gelp?	Pig wearing a cowboy hat	Blue and yellow polka-dotted lizard	Purple animal	Horse

Prepositions	36	Show me the doll is above the present.	Doll sitting on shelf below present	Doll sitting on a shelf above present	Doll sitting behind present, on the same shelf	
	37	Find the ball is behind the pail.	Ball is above the pail	Ball is behind the pail	Ball is below the pail	
	38	Show me the apples are in front of the bowls.	Apples are in between bowls, but not in bowls	Apples are behind the bowls	Apples are in front of the bowls	
	39	Find the firefighters are between the chairs.	Firefighters are between the chairs	Firefighters are in front of the chairs	Firefighters are behind the chairs	
	40	Find the umbrella is below the swing.	Umbrella is on the swing	Umbrella is above the swing	Umbrella is below the swing	
Adjective Learning	41	What else is zavish?	Bed with red and white zigzags	Chair with red dots	Red table	
		Show me what else is zavish.	Star object with blue and white dots	Blue table	Dresser with blue and white swirl design	
	42	What else is mezzish?	Blue eagle with design	Blue polka-dotted turkey	Blue toucan	
		Show me what else is mezzish.	Red toucan	Red dragon fly with design	Red polka-dotted butterfly	
	43	What else is gilpish?	Purple and white tie with herring-bone design	Purple sweater	Purple dress with design	
		Show me what else is gilpish.	Orange sweater	Orange and white door with a design	Orange mailbox with design	
	44	What else is veamish?	Orange sock with design	Orange teacup	Orange and teal purse	
		Show me what else is veamish.	Yellow and teal lightbulb	Yellow teacup	Yellow can with design on three legs	
	45	What else is bluggish?	Green truck	Green and purple airplane	Sailboat with green ampersands	
	Show me what else is bluggish.	Blue truck	Vehicle with blue ampersands	Blue and purple scooter		
Conjunctions	46	Who ate the food before the cat jumped on the table?	Gray cat	Tan dog	Black dog	
	47	Who came down the slide after the school bus arrived?	School bus	Boy in a green shirt	Girl in blue shirt	
	48	Who picked up the cake because the baby ate it?	Mother	Boy	Baby	

Table 9.4. Convergent validity coefficients

		Vocabulary standard score	Syntax standard score	Process standard score	Overall standard score
PPVT-4 standard score	Pearson correlation	.672**	.544**	.577**	.670**
	<i>n</i>	116	116	116	116
PLS-5 Auditory Compre- hension standard score	Pearson correlation	.593**	.540**	.616**	.645**
	<i>n</i>	112	112	112	112

**Correlation is significant at the 0.01 level (2-tailed).

Key: PLS-5, Preschool Language Scales–Fifth Edition (PLS-5; Zimmerman, Steiner, & Pond, 2011); PPVT-4, Peabody Picture Vocabulary Test–Fourth Edition (PPVT-4; Dunn & Dunn, 2007).

Convergent Validity

To assess convergent validity, 40 children from the Second Item Tryout were randomly assigned to also be tested on the Auditory Comprehension Subtest of the Preschool Language Scale, 5th Edition (PLS-5; Zimmerman et al., 2011), and 44 children from the Second Item Tryout were randomly assigned to be tested on Form A of the Peabody Picture Vocabulary Test, 4th Edition (PPVT-4; Dunn & Dunn, 2007). In addition, 72 children attending certain Head Start programs were administered both the PLS-5 and PPVT-4 as part of concurrent research projects at these schools. Both the PPVT-4 and the PLS-5 assess aspects of language development, have been normed on a representative population, and have demonstrated validity and reliability. Tests measure and emphasize different aspects of language; nonetheless, we would expect reasonably high correlations among the different tests. This was achieved for the QUILS, comparing it to these two well-known assessments (see Table 9.4). Table 9.4 presents the convergent validity coefficients for the group tested as part of the normative sample. The overall QUILS standard score correlates highly with PLS-5 and PPVT-4 standard scores. The area scores (i.e., Vocabulary, Syntax, and Process) also correlate highly with these assessments. Given that the PPVT-4 is a measure of vocabulary, the development team predicted that the area of the QUILS that would correlate most strongly with the PPVT-4 would be the Vocabulary area, and analyses confirmed this prediction. Thus, these results, together with the results of the construct validity tests, provide confirmation that the QUILS is measuring important aspects of language development for young children from the ages of 3;0 through 5;11. Children’s performance on the QUILS predicts their performance on other omnibus tests of language development (e.g., PLS-5) as well as on tests that measure a single area (e.g., PPVT-4).

Reliability



The reliability of a test asks whether the scores are stable for one individual at different times. Another aspect of reliability is whether children’s scores on the items cluster in meaningful ways. That is, children should pass items that reflect their ability and not pass a random selection of easy and hard items.

Test–Retest Reliability

Seventy-five of the students participating in the Second Item Tryout were randomly assigned to take the QUILS a second time. Score stability was examined by using the data

Table 9.5. Test–retest reliability coefficients ($n = 75$)

Measure	Measure			
	Vocabulary	Syntax	Process	Overall
Vocabulary	.71			
Syntax		.73		
Process			.69	
Overall				.83

gathered from these 75 students. The time interval between the first and second testing ranged from 3 to 5 weeks for nearly all participants. Table 9.5 presents test–retest reliability coefficients, as well as averaged coefficients calculated with Fisher’s z transformation. The average coefficient for the overall QUILS is somewhat higher than coefficients for the three areas of Vocabulary, Syntax, and Process because of the large number of items overall (48 items) versus in the areas (16 items). The overall coefficient is .83, and the coefficients ranged from .69 for Process, to .71 for Vocabulary, to .73 for Syntax. In sum, test–retest coefficients indicate that standard scores from the QUILS possess reasonable stability across short time periods. Test–retest reliability is an important aspect of the QUILS for two reasons: 1) 3- to 5-year-olds generally show variability in their behavior, and 2) they are in a growth phase for language development. Thus, the QUILS is capable of reliably capturing children’s performance.

Internal Consistency Reliability

Demonstrating that a test has internal consistency of its items is another metric of reliability. Cronbach’s (1951) coefficient alpha is used to calculate internal consistency reliability. Coefficient alpha provides a lower bound value of test reliability and is considered to be a conservative estimate of a test’s reliability (Allyn & Yen, 1979; Carmines & Zeller, 1979; Reynolds, Livingston, & Willson, 2009). For the Vocabulary and Syntax areas, the coefficient alpha is .79 for each area. The coefficient alpha is .87 for the Process area and .93 for the overall QUILS. These good to high coefficient values demonstrate that items are coherent in measuring the unidimensional construct underlying each of the areas of the screener and also the overall QUILS as a language comprehension screener for young children.

Interrater Reliability

Interrater reliability is an analysis that quantifies the amount of agreement between two or more raters of the same phenomenon, in this case student performance on a language screening. Measurement error is introduced into scores when different people administer or score a test on the same individual’s performance differently. However, because the QUILS administration and scoring are automated and by definition standardized, concerns regarding interrater reliability are minimized. The development team tested this proposition by comparing standard scores at the different sites at which testing occurred. Results indicated that standard scores on the QUILS are no different between the sites at which testing was conducted. Thus, any differences between individuals’ scores on the QUILS cannot be attributable to testing at different sites with different testers. The QUILS therefore has a standardized delivery.

Scores



This section describes how the standard scores and percentile ranks for the QUILS were derived by the development team and the psychometricians working with them. Rationale for deriving cut scores is also explained. For information on the scoring of the QUILS (e.g., point assignment for correct answers, generation of raw scores), see Chapter 7.

Generation of Standard Scores

The QUILS standard scores are generated based on age norms and the QUILS raw scores. The standard score reflects each child's performance as compared to the norms generated from the final norming sample of children for each age (3, 4, and 5 years). The norming sample was a subsample of 415 children from the Second Item Tryout sample, stratified by SES status and gender to match the U.S. census (see Table 9.1) and with a more equal representation by age band.

The standard scores for the QUILS were normalized to the bell-shaped distribution in the area (Vocabulary, Syntax, Process) scores, and these area scores were produced for each of the three age groups in the standardization sample. Next, each area score variable was transformed so that its shape matched the bell-shaped curve with a mean of 100 and a standard deviation of 15. A scaled score was then created by summing the three standardized area scores, and the norming process was repeated on this scaled score to derive a standardized overall score. As with the area scores, the scaled score was transformed so that its shape matched the bell-shaped curve with a mean of 100 and a standard deviation of 15. Finally, norms tables were developed by comparing each standard score to its corresponding raw score. The normative tables of the QUILS, with standard scores and percentile ranks for the Vocabulary area, the Syntax area, the Process area, and overall, are presented in Tables 9A.1–9A.4. This process of transforming raw scores to normalized standard scores represents the most common application of a “nonlinear area conversion” (Thorndike, 1982, p. 115).

Generation of Percentile Ranks

Percentile ranks reflect where children's standard scores fall compared to other children of the same age. The QUILS provides both standard scores and percentile ranks. A principal advantage of the normalized transformations used with the QUILS is that percentiles corresponding to identical standard scores are equal because they follow well-known properties of the bell-shaped curve. Thus, all normalized standard scores of 115 will hover around a percentile rank of 84, and all normalized standard scores of 130 will hover around a percentile rank of 98. Standard scores are associated with percentile ranks based on the child's raw score and age (see Tables 9A.1–9A.4).

Determination of Cut Scores

Cut scores were determined by considering the role of the QUILS in screening children at risk for language impairment. A language screener should try to identify all children who might be at risk, as the cost associated with missing vulnerable children is greater than the cost of unnecessarily screening children who will pass a more comprehensive test. For that reason, the development team judged scoring below the 25th percentile to be a conservative estimate of risk, given that the population of children with language impairments is estimated to lie between 7% and 12% (Tomblin et al., 1997; Leonard, 2014). The cut scores are based on this 25th percentile.

Rasch Analyses

Separate Rasch analyses were conducted on each area of the QUILS as well as on the overall screener. Fit statistics for each of the areas and overall were close to the expected value of 1. Fit statistics were also investigated at the item level for all areas and overall. More emphasis was placed on the Infit Mean-Square (MNSQ) because it is a weighted measure and is sensitive to the study subjects near the item level on the underlying ability continuum. (A mean-square value of .5–1.5 is regarded as productive for measurement. See <https://www.rasch.org/rmt/rmt162f.htm>.) Infit MNSQ values for all items in each of the three areas and overall were within the expected range of –0.7 to 1.3.

Further evidence of reliability was established by high (1.6–10) person and item separation values, suggesting that each of the areas and the screener overall can successfully differentiate the different proficiencies of students and that items are well spread along the measures of difficulty.

The mean of “person ability measure” indicates if item difficulty is within the range of participants’ abilities. The mean of item difficulties is set to 0. This is done to fix the scale within a calibration. For example, if the mean of person ability measure is 1, then the screener is easier for this sample of students. If the mean of person ability measure is –1, the screener is more difficult for this sample of students. For all three areas and the screener overall, the mean of person ability measure is a close match to the mean of item difficulties of 0, demonstrating an excellent match of items to the sample population.

Evaluation and Reduction of Screener Bias

Differential item functioning (DIF) analysis is typically performed to ensure that items are of similar difficulty across groups. The distinctive features of DIF analysis are: 1) it is done at the item level, and 2) examinees are matched on their underlying ability in the two groups before comparing their performance on the item. DIF analysis is typically performed with respect to two groups at a time. For QUILS, DIF analysis was performed with respect to gender. Language acquisition research has not found marked difference in typical children’s language development by gender, although there is a bias in children with language delays because boys outnumber girls. The DIF analysis ensures that the items are not in themselves biased against one gender or another, regardless of ability level. For each area, each item was tested for DIF across gender groups. When an item shows significant DIF, it means the item displays different difficulty levels for boys and girls. Although some individual items show DIF in favor of one or another gender, it can be argued that since on balance, the DIFs cancel out, neither of the groups is disadvantaged by including these items (Nandakumar, 1993).

Future Directions

At the time of publication of this User’s Manual, the QUILS developers are collecting systematic data on children who have documented language problems in order to provide estimates of the sensitivity and specificity of the QUILS for a clinical population.

Appendix 9A: Normative Tables

Table 9A.1. Raw scores, standard scores, and percentile ranks for the Vocabulary area of the QUILS

Vocabulary			Vocabulary			Vocabulary		
3;0–3;11			4;0–4;11			5;0–5;11		
Raw Score	Standard Score	Percentile Rank	Raw Score	Standard Score	Percentile Rank	Raw Score	Standard Score	Percentile Rank
0	62	<0.8	0	61	<0.6	0	62	<1.5
1	62	0.8	1	61	0.6	1	62	<1.5
2	70	6.9	2	68	2.6	2	62	<1.5
3	78	13.8	3	73	3.9	3	62	1.5
4	85	21.5	4	77	11.0	4	70	4.6
5	93	31.5	5	82	15.6	5	76	5.3
6	100	50.8	6	87	22.1	6	79	8.4
7	103	60.0	7	89	27.3	7	84	18.3
8	105	68.5	8	94	35.1	8	89	22.9
9	107	74.6	9	97	44.8	9	92	34.4
10	110	80.0	10	100	55.2	10	96	43.5
11	113	86.2	11	102	61.7	11	98	52.7
12	116	92.3	12	105	73.4	12	102	58.0
13	119	94.6	13	112	84.4	13	106	67.2
14	125	96.2	14	118	89.0	14	110	83.2
15	131	99.9	15	125	96.1	15	119	94.7
16	131	99.9	16	131	99.9	16	128	99.9

Note: Vocabulary raw score = Total number of correct responses (out of 16) on the Vocabulary area.

Table 9A.2. Raw scores, standard scores, and percentile ranks for the Syntax area of the QUILS

Syntax			Syntax			Syntax		
3;0–3;11			4;0–4;11			5;0–5;11		
Raw Score	Standard Score	Percentile Rank	Raw Score	Standard Score	Percentile Rank	Raw Score	Standard Score	Percentile Rank
0	66	<1.5	0	62	1.3	0	62	<0.8
1	66	1.5	1	68	3.9	1	62	0.8
2	75	6.2	2	68	3.9	2	67	2.3
3	83	20.0	3	74	6.5	3	72	3.8
4	90	32.3	4	79	13.0	4	78	9.2
5	96	40.8	5	84	20.1	5	82	10.7
6	101	61.5	6	88	25.3	6	85	16.0
7	106	73.8	7	93	34.4	7	88	25.2
8	110	76.9	8	97	45.5	8	91	30.5
9	113	83.8	9	100	53.2	9	94	36.6
10	116	90.0	10	102	59.1	10	98	46.6
11	120	93.8	11	104	68.8	11	100	58.0
12	124	96.9	12	108	76.0	12	103	68.7
13	124	96.9	13	112	81.8	13	107	77.9
14	128	99.2	14	119	90.3	14	114	87.8
15	132	99.9	15	126	96.8	15	122	91.6
16	132	99.9	16	132	99.9	16	131	99.9

Note: Syntax raw score = Total number of correct responses (out of 16) on the Syntax area.

Table 9A.3. Raw scores, standard scores, and percentile ranks for the Process area of the QUILS

Process			Process			Process		
3;0-3;11			4;0-4;11			5;0-5;11		
Raw Score	Standard Score	Percentile Rank	Raw Score	Standard Score	Percentile Rank	Raw Score	Standard Score	Percentile Rank
0	73	5.4	0	66	1.3	0	62	<0.8
1	82	14.6	1	73	4.5	1	62	0.8
2	88	31.5	2	83	14.9	2	65	1.5
3	94	43.1	3	87	20.8	3	74	4.6
4	100	51.5	4	90	26.6	4	80	9.9
5	103	58.5	5	91	27.9	5	83	14.5
6	107	68.5	6	93	34.4	6	86	19.1
7	108	74.6	7	95	42.2	7	87	21.4
8	111	76.9	8	98	46.8	8	89	26.7
9	114	82.3	9	100	50.6	9	93	37.4
10	115	84.6	10	101	57.8	10	96	43.5
11	117	88.5	11	103	64.3	11	100	51.1
12	120	90.8	12	107	71.4	12	101	61.8
13	123	93.8	13	110	80.5	13	105	71.0
14	125	96.9	14	115	90.9	14	112	83.2
15	130	99.2	15	120	96.8	15	118	92.4
16	135	99.9	16	133	99.9	16	131	99.9

Note: Process raw score = Total number of correct responses (out of 16) on the Process area.

Table 9A.4. Scaled scores, standard scores, and percentile ranks for the QUILS Overall

Overall			Overall			Overall		
3;0–3;11			4;0–4;11			5;0–5;11		
Scaled Score	Standard Score	Percentile Rank	Scaled Score	Standard Score	Percentile Rank	Scaled Score	Standard Score	Percentile Rank
186–225	62	<0.9	186–212	62	<0.6	186–190	62	<0.7
226	62	0.9	213	62	0.6	191	62	0.7
227	65	1.4	214–222	64	2.2	192–207	64	1.4
228–240	69	1.9	223	68	2.5	208–214	68	3.4
241	72	4.2	224–228	70	2.9	215	70	4.1
242–247	74	4.7	229	73	3.5	216–235	73	6.2
248	77	6.1	230–231	75	4.1	236	76	6.8
249	79	6.6	232–234	77	6.3	237–239	77	8.2
250	80	8.5	235–238	78	7.6	240–242	78	8.9
251–252	81	9.4	239	79	8.6	243–245	79	11.0
253	82	9.9	240–243	80	10.2	246	80	11.6
254	83	13.1	244–246	81	13.3	247–253	81	13.7
255–258	84	16.9	247	82	14.0	254	82	14.4
259–262	85	20.7	248	83	15.6	255	83	15.8
263–264	86	23.0	249–251	84	17.1	256–259	84	17.1
265–266	87	25.4	252–256	85	21.3	260–261	85	18.5
267–268	88	27.7	257–261	86	24.8	262–263	86	20.5
269	89	30.0	262–265	87	27.9	264–265	87	21.2
270	90	31.5	266–267	88	29.2	266–267	88	23.3
271–272	91	36.6	268–269	89	32.4	268–270	89	25.3
273–274	92	39.4	270–271	90	35.2	271–276	90	30.8
275–276	93	40.4	272–275	91	38.7	277–280	91	33.6
277–281	94	47.4	276–278	92	41.3	281–282	92	37.0
282	95	48.4	279–280	93	44.1	283–284	93	39.7
283–287	96	56.3	281–284	94	47.9	285–287	94	41.1
288–289	97	57.7	285–286	95	50.8	288–290	95	43.2
290–292	98	59.6	287–288	96	53.3	291–294	96	47.3
293–294	99	62.4	289–290	97	55.9	295–296	97	49.3
295–297	100	63.4	291–292	98	59.4	297–298	98	51.4
298–301	101	66.2	293–296	99	62.5	299–301	99	54.1
302–307	102	68.5	297–298	100	66.0	302–304	100	55.5

(continued)

Table 9A.4. (continued)

Overall			Overall			Overall		
3;0–3;11			4;0–4;11			5;0–5;11		
Scaled Score	Standard Score	Percentile Rank	Scaled Score	Standard Score	Percentile Rank	Scaled Score	Standard Score	Percentile Rank
308–309	103	70.0	299–302	101	68.9	305	101	56.2
310–311	104	72.8	303–304	102	72.1	306–307	102	59.6
312	105	73.2	305–306	103	74.0	308–310	103	64.4
313–317	106	76.5	307–312	104	77.5	311–313	104	65.8
318–319	107	77.9	313–314	105	78.4	314–315	105	67.8
320–321	108	79.8	315–317	106	80.0	316–317	106	70.5
322–326	109	81.7	318–326	107	81.9	318–319	107	72.6
327	110	82.2	327–328	108	83.8	320–321	108	74.7
328–331	111	83.6	329	109	85.4	322–323	109	76.0
332–334	112	85.4	330–331	110	86.7	324–327	110	77.4
335–336	113	86.4	332–334	111	87.6	328–329	111	80.1
337–339	114	87.8	335–337	112	88.9	330–331	112	80.8
340–341	115	89.2	338–339	113	89.5	332–334	113	82.2
342–343	116	90.1	340–341	114	90.5	335	114	82.9
344–349	118	92.0	342–345	115	91.4	336	115	84.9
350	119	93.4	346	116	92.4	337–342	116	85.6
351–352	120	93.9	347	117	93.3	343–344	117	87.7
353–354	121	94.8	348	118	93.7	345	118	89.0
355	122	95.8	349	119	94.3	346	119	90.4
356	123	96.2	350	120	94.6	347–351	121	93.2
357	124	96.7	351	121	94.9	352–353	122	93.8
358–359	125	97.2	352	122	95.9	354	123	94.5
360–370	126	97.7	353–357	123	96.5	355	124	95.2
371–374	128	98.1	358–360	124	96.8	356–357	126	95.9
375	130	98.6	361–364	126	97.5	358–368	127	96.6
376–380	131	99.1	365	127	97.8	369–372	128	97.3
381–383	133	99.5	366–370	129	98.4	373–377	130	97.9
384–405	135	99.9	371–372	132	98.7	378–381	133	98.6
			373–377	133	99.4	382–405	135	99.9
			378–383	134	99.7			
			384–405	135	99.9			

Note: The scaled area score is *not* equal to the total number of items the student answered correctly. Scaled area score = Syntax standard score + Vocabulary standard score + Process standard score.

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