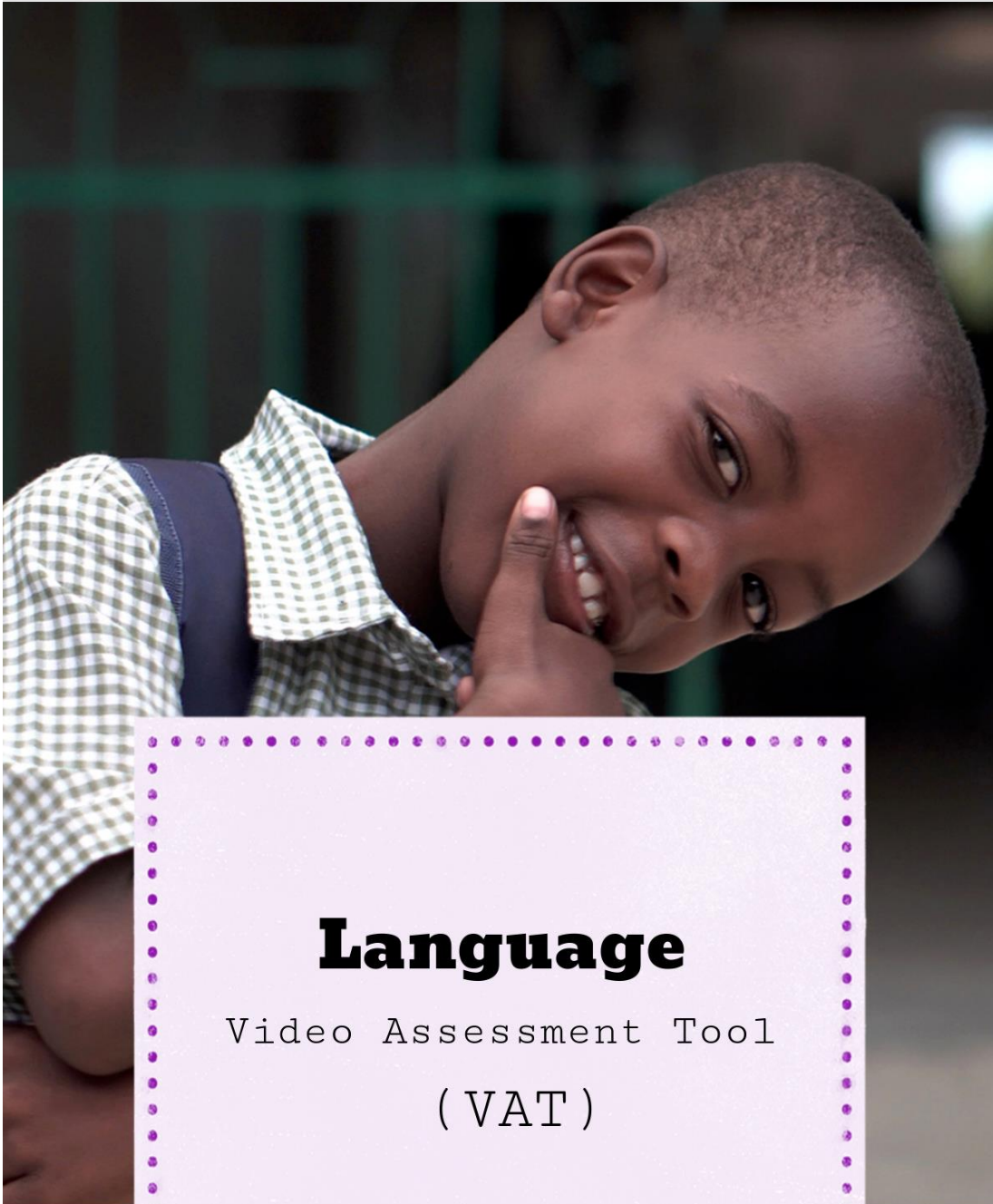


# VideoAssessmentTools



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## About the Author

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## Overview of the Test

### *Language Video Assessment Tool Description*

The *Language Video Assessment Tool (VAT)* is a norm-referenced language testing battery for children and young adults ages 6 through 18 years old. It is composed of four stand-alone tests. It is an accurate and reliable assessment tool that provides valid results on language comprehension, story retell, following directions, and morphology and sentence structure. Normative data of this test is based on a nationally representative sample of 1554 (typically developing) children and young adults in the United States.

### *Language Video Assessment Tool Areas*

The test is composed of four independent and stand-alone tests: (a) Language Comprehension in Context, (b) Restating Information, (c) Following Directions, and (d) Morphology and Sentence Structure.

### *Testing Format*

The *Language VAT* is composed of four tests. Each test is video-based and requires access to a laptop or tablet. Each test yields a standard score and percentile. While completing each test, students will be asked to complete trial items and then continue into test items.

### *Administration Time*

Administration time for the test takes approximately 40-50 minutes.

### *Test Uses*

The results of the *Language Video Assessment Tool* provide comprehensive information on language comprehension and oral expression development of children and young adults. It presents with four essential purposes:

- a) To help identify developmental language disorders and determine eligibility for special education services (e.g., initial IEP based evaluations);
- b) To help determine strengths and weakness within a variety of language domains (e.g., morphology, syntax, spoken language comprehension);

- c) To help document progress in language skills, measure treatment efficacy or re-evaluate overall language profiles as part of triennial IEP based reviews;
- d) To help analyze language skills in children and young adults for research purposes

## *Features*

### Unique Design of Using Video Based Scenes and Instructions

One of the most notable benefits of the *Language VAT* is its unique test design consisting of videos and pictures to engage students during testing. The videos are presented in relevant, life-like content, and the actors in the videos are from a wide variety of ethnic and cultural backgrounds. The videos are presented at a rate that is controlled for speed without being unnaturally slow. Vocabulary used in the videos is appropriate to the testing age range (5-0 through 18-0), and the real-life scenes are those which might be expected to occur in educational setting or real-life in general.

### *Language Video Assessment Tool Uses and Purpose*

The information obtained from the *Language Video Assessment Tool* can help determine what areas a child has deficits in and how deficits in these areas may impact the child in both the classroom and in the home environment. The *Language VAT* should be used to evaluate children or young adults who have a suspected or previous diagnosis of a language disorder. This tool will assist in the identification or continued diagnosis of a spoken language comprehension and/or expressive language disorder. The results of the *Language VAT* provide clinicians information on children and young adult's ability to comprehend spoken language and use spoken language. By utilizing the *Language VAT*, we are able to develop a better understanding as to how a student's language abilities may impact their academic performance, progress in school, and social interactions.

### *Language Video Assessment Tool Area Descriptions*

#### ***Language Comprehension in Context***

The *Language Comprehension in Context* test evaluates a student's ability to attentively listen to a short passage and then answer questions about the presented story. This test requires students to listen carefully, understand the main idea, remember key details and the sequence of events, and to use critical thinking skills to interpret inferences and make predictions. Difficulties in language comprehension may impact a student across the school-age years when attempting to understand orally presented stories as well as when attempting to follow along with a classroom lesson, text, or video.

*Sample Language Comprehension in Context Item:* At the beginning of the test, the clinician explains the test to the examinee by saying, "You are about to watch some videos about nature. Please watch and listen carefully. You will be allowed to watch each video only one time. I will ask you questions about each video. Please do your best to answer the questions. You can ask me to repeat the question. I will be able to repeat the question only one time. If you don't know or can't remember the answer, it's okay to say, 'I don't know' or 'I can't remember.' So please tell me now, what are you supposed to do?" Then the clinician will play the video, and the examinee will be asked questions about what happened/what was discussed in the video clip.

## **Restating Information**

The *Restating Information* test evaluates a student's ability to listen to, comprehend, and then retell a story immediately after the presentation of the story. Students are asked to listen carefully and then tell the story back to the clinician. Difficulties in listening to and retelling a story may impact a student across the school-age years in assignments that require organization, sequencing, or describing. Students who have difficulty with retelling a story may have difficulties with story comprehension and/or vocabulary.

*Restating Information Item:* At the beginning of the test, the clinician explains the test to the examinee by saying, "You are going to watch some videos. Please watch and listen carefully. You will watch the video only one time. After you are done watching, I need you to tell me what the videos are about and all the details that you can remember. So, tell me, what are you supposed to do now?"

## **Following Directions**

The *Following Directions* test items evaluate an individual's ability to interpret spoken directions, recall those directions, and then act upon those spoken directions. A student's success on this test reflects his/her comprehension and immediate recall abilities. Difficulties in following and executing directions may impact a student across the school-age years when attempting to follow along with teacher instructions in the classroom and when completing school assignments that requires following procedural directives.

*Sample Following Directions Item:* At the beginning of the test, the clinician explains the test to the examinee by saying, "I am going to show you some pictures and ask you to draw some things. First, I want you to listen while I ask you to do something. Then, after I say 'go,' you can follow the instructions and draw. I can repeat the instructions for you one time if you need me to. So, can you please tell me what you are supposed to do now?" Trial A: Point to the bus. Go. Trial B: Draw a pumpkin. Go.

## **Morphology and Sentence Structure**

The *Morphology and Sentence Structure* test evaluates a student's ability to use grammatical morphemes and to compose meaningful and grammatically correct sentences. This test requires students to describe what is going on in a picture, retrieve a word to complete a sentence, and/or formulate sentences based upon a picture and specific words. Difficulties in morphology and sentence structure may impact a student across the school-age years when telling a story, completing a writing assignment, or during discourse or conversation with peers.

*Sample Morphology and Sentence Structure Item:* At the beginning of the test, the clinician explains the test to the examinee by saying, "You are going to watch some videos. After watching each video, you will be asked to answer a question about the video or you will be asked to complete a sentence about the video. Let's try one."

## *Standardized Video-Based Assessment*

In the past few decades, the speech and language pathology field has begun incorporating multimedia features such as audio and animation into interventions and assessment tools. Numerous studies have investigated the potential advantages of using multimedia on young children's language production. For example, Schlosser's et al. (2014) study found that children between three and five years old were able to name animated symbols more easily than static symbols. Another study found that children increased

their identification of action verbs when the target included animation (Mineo, Peischl, & Pennington, 2008). Verhallen, Bus, and De Jong (2006) investigated the positive effects of animated books on narrative comprehension and language skills. The researchers found that when 3 and 5 year old children, from low educated families, were presented with a story with static images versus a story with multimedia additions (e.g., cinematic techniques such as zoom, pans, and sound effects), the stories with multimedia additions provided a better framework for understanding stories and remembering linguistic information. Gazella and Stockman (2003) compared children's ability to retell a story after listening to a story with only audio versus listening to a story while seeing pictures (audiovisual). Gazella and Stockman (2003) found that for children 4 years of age, there was a difference observed in macrostructural aspects of children's narratives. Specifically, these children made more inferences and told better stories when presented with an audiovisual format. Diehm, Wood, Puhlman, and Callendar (2020) further examined the effect of story presentation (static pictures versus animated videos) on preschool children's narrative story retelling. The results of the study revealed that typically developing children demonstrated higher quantity and quality of language within a story retell in response to an animated video than after viewing static images. This study suggests that when presented with a short video versus a picture book, young children may produce longer narrative retells, use a wider variety of vocabulary, and produce more complex syntax (Diehm, Wood, Puhlman, & Callendar, 2020).

The incorporation of videos may also allow students to focus on the salient features of instructions, eliminating the distraction of human interactions such as sounds, body language, tone of voice, and smells. This may be particularly beneficial for students with autism spectrum disorder who may have difficulty with some human interactions that tend to be emotionally loaded (Neumann, 2004). With the use of videos, extraneous variables can also be controlled and/or eliminated and have students focus on a screen, which may minimize attentional and language requirements (Sherer, Pierce, Paredes, Kisacky, Ingersoll, & Schreibman, 2001).

Diehm, Wood, Puhlman, and Callendar (2020) investigated the effect of story presentation (static pictures versus animated videos) on preschool children's narrative story retelling. Typically developing children demonstrated higher quantity and quality of language within a story retell in response to an animated video than after viewing static images. This study suggests that when presented with a short video versus a picture book, young children may produce longer narrative retells, use a larger variety of vocabulary, and produce more complex syntax (Diehm, Wood, Puhlman, & Callendar, 2020).

## Theoretical Background of the Language Video Assessment Tool

Spoken language comprehension and oral expression, refers to the understanding and the use of spoken language across various contexts and social situations. Approximately 7% of children have deficits in language comprehension or language use and these difficulties can persist into the school-age years and interfere with communication, academics, and social interactions (Tomblin, Records, Buckwalter, Zhang, Smith, & O'Brien, 1997). Longitudinal studies have revealed that language impairments that persist into school age remain in adolescence (Conti-Ramsden & Durkin 2007) and adulthood (Johnson, Beitchman, & Brownlie, 1999; Clegg, Hollis, Mawhood, & Rutter, 2005), often with accompanying literacy deficits (Clegg, Hollis, Mawhood, & Rutter, 2005, Snowling & Hulme, 2000). Lindsay and Dockrell (2012) conducted a longitudinal study with adolescents who were identified as having specific language impairment (SLI) during the early primary grades. This study assessed the behavioral, emotional, and social difficulties of students in relation to self-concept, language, and literacy abilities over time. Participants were followed from 8 years old to 17 years old. Lindsay and Dockrell (2012) found that poor language and literacy skills continued, and peer and conduct problems were found to increase over this age range. Joffe and Black (2012) explored behavioral, emotional, and social difficulties in young adolescents who, based on teacher report, were identified as having low language skills and/or poor academic achievement. These students had not been clinically diagnosed as having a language disorder. Results of Joffe and Black's (2012) study indicate that even students with subtle language problems can negatively impact school and social interactions. The researchers emphasized the need to identify and treat language weakness in all students so that all children can be properly supported.

Previous research findings have suggested that nearly all school-based speech-language pathologists use standardized testing as part of their student's diagnostic tools (Caesar & Kohler, 2009), and that half of SLPs regard standardized testing as the most important data collected during their evaluations and all SLPs ranked standardized testing in the top five most important tools (Eickhoof, Betz, & Ristow, 2010). Huang, Hopkins, and Nippold (1997) found that school-based SLPs were unsatisfied with current standardized testing and this was related to the time it took to actually complete the assessments and the time workplaces gave SLPs to finish the assessments. Thus, there is a clear need for both formal and informal assessment tools that aid in the identification of language disorders that are reliable, valid, and also timesaving. Without appropriate assessment and intervention, there can be serious negative impacts to a child's development, education, and social interactions. For example, a child who has difficulty with their ability to understand spoken language may find it difficult to follow along during classroom

instruction and fall behind in their classwork. A child who has trouble understanding or using spoken language may have difficulty developing meaningful peer relationships and friendships, which could lead to a variety of other difficulties such as behavioral and emotional problems. By assessing students with the *Language VAT*, speech-language pathologists are able to evaluate students with multimedia features (e.g., audio, animation, music) and tools (e.g., computers, tablets) that align with children's interests during this technological age they are growing up in. SLPs can depend on this effective, reliable, and valid formalized assessment tool to evaluate student's abilities and identify those individuals who have a suspected or an existing diagnosis of a language disorder and the impact the language disorder may have on the child.

### *Contextual Background for Test Areas*

*Language impairment* involves difficulty in the understanding and/or use of spoken, written, and/or other symbol systems. The disorder may involve: "(1) the form of language (phonology, morphology, syntax); (2) the content of language (semantics); and/or (3) the function of language in communication (pragmatics) in any combination" (ASHA, 2016). Listening comprehension is a high-order skill that involves both language and cognitive abilities (Florit, Roch, & Levorato, 2013; Kim & Phillips, 2014; Lepola, Lynch, Laakkonen, Silven, & Niemi, 2012). Specifically, listening comprehension refers to one's ability to comprehend spoken language (e.g., conversations, stories/narratives) by extracting and constructing meaning. Research has showed that listening comprehension is critical to reading comprehension (Foorman, Koon, Petscher, Mitchell, & Truckenmiller, 2015; Kim, 2015; Kim, Wagner, & Lopez, 2012; Kim & Wagner, 2015). When children present with reading comprehension deficiencies, there is a heavy focus on word recognition difficulties, including dyslexia and learning disabilities. Difficulties with word recognition are linked to weakness in the phonological domain of language and are often identified early on in the pre-school years (Catts, Fey, Zhang, & Tomblin, 2001). On the other hand, some children demonstrate reading comprehension difficulties despite adequate word reading abilities (Catts, Adlof, & Ellis Weismer, 2006; Nation, Clarke Marshall, & Durand, 2004). This group of individuals is known as poor comprehenders. Poor comprehenders are able to read text accurately and fluently at age-appropriate levels, however, they have difficulty understanding what they are reading (Cain & Oakhill, 2007; Nation, 2005). For example, when reading, poor comprehenders have weaknesses in the areas of semantics, syntax (Catts, Adlof, & Ellis Weismer, 2006; Nation & Snowling, 1998; Nation, Snowling, & Clarke, 2007) and more complex parts of language such as idioms, inferencing, comprehension monitoring, and knowledge of text structure (Oakhill, 1984; Cain & Towse, 2008; Cain, Oakhill, & Bryant, 2004; Oakhill & Yuill, 1996). Additionally, when we consider narrative comprehension, children with language disorders are less likely to provide correct answers to literal or inferential questions about stories that have been read to them (Gillam, Fargo, & Robertson, 2009; Laing & Kamhi, 2002). Since reading comprehension takes time to develop, it is difficult to demonstrate reading comprehension deficits in children before they are able to read accurately and fluently. Thus, these students' reading comprehension deficits may go unnoticed until later grades. As such, it is critical that language deficits are identified as early on in development as possible.

There is also a strong relationship between oral language abilities and reading ability (Hulme & Snowling, 2013). Nation, Clarke, Marshall, and Durand (2004) investigated poor comprehenders' spoken language skills. The results of this study found that these students were less skilled than those in the typically developing group on semantic tasks (e.g., vocabulary and word knowledge), morphosyntax (e.g., past tense inflection, sentence comprehension) and aspects of language use (e.g., understanding figurative language). Research also suggests that students with expressive language difficulties are four

to five times more likely than their peers to present with reading difficulties (Catts, Fey, Zhang, & Tomblin, 2001). For example, Zielinski, Bench, and Madsen (1997) explored expressive language delays in preschoolers and found that these children were more likely to have difficulties with reading performance. Poll and Miller (2013) also reported that when children are 8 years old, expressive language delays could be a significant risk factor for poor oral language and reading comprehension. Furthermore, Lee (2011) discovered that expressive language development predicts comprehension of reading passages in both third and fifth grade students. Vocabulary can also play an important role early on in development as was demonstrated in Duff, Reen, Plunkett, and Nation's (2015) study that found infant vocabulary between 16 and 24 months is predictive of reading comprehension early on in school instruction years. Additionally, Pysridou, Eklund, Poikkeus, and Torppa's study (2018) found that expressive language ability at age 2–2.5 years old is associated with reading comprehension in ages 8–16 years old.

Listening comprehension and oral language abilities can also be important when we consider writing development (Kim, Al Otaiba, Wanzek, & Gatlin, 2015; Hulme & Snowling, 2013). Children with language impairments have been found to show grammatical errors (Gillam & Johnston, 1992; Scott & Windsor, 2000; Windsor, Scott, & Street, 2000) and spelling errors in their written texts. The spelling errors are similar to those found in children with dyslexia (Puranik, Lombardino, & Altmann, 2007), however, an individual's ability to create and think of new ideas appears to be specific to difficulties within the language system (Bishop & Clarkson, 2003; Puranik, Lombardino, & Altmann, 2007). Numerous studies have explored the difficulties that school-age children with language impairment have with telling stories. For example, when compared to typically developing children, children with language deficits tend to compose stories that contain fewer words and utterances (Moyano & McGillivray, 1988 [as cited in Hughes, McGillivray, & Schmidek, 1997]), fewer story grammar components (Paul, 1996), reduced sentence complexity (Gillam & Johnston, 1992), fewer complete cohesive ties (Liles, 1985), increased grammatical errors (Liles, Duffy, Merritt, & Purcell, 1995; Norbury & Bishop, 2003), and poorer overall story quality (Gillam, McFadden, & van Kleeck, 1995; McFadden & Gillam, 1996).

Over the last thirty years, there has been an abundance of research demonstrating that children with specific language impairment (SLI) are at a disadvantage when it comes to peer relationships (Durkin & Conti-Ramsden, 2010). Individuals with SLI engage less in active conversation interactions, enter less frequently into positive social interactions, demonstrate poorer discourse skills, are more likely to provide inappropriate verbal responses, and are less likely to influence others successfully (Hadley and Rice, 1991; Craig, 1993; Craig and Washington, 1993; Grove, Conti-Ramsden, & Donlan, 1993; Guralnick, Connor, Hammond, Gottman, & Kinnish, 1996; Brinton, Fujiki, & McKee 1998; Vallance, Im, & Cohen 1999). Children with SLI also tend to score lower in the areas of social skills, social cognitive abilities, and may have trouble with behavioral and emotion regulation (Cohen, Barwick, Horodezky, Vallance, & Im, 1998; Fujiki, Brinton, & Clarke, 2002; Marton, Abramoff, & Rosenzweig, 2005; Lindsay, Dockrell, & Strand, 2007). Additionally, children with language impairments are at higher risk of academic failure, social exclusions, behavioral and emotional difficulties, and are more vulnerable to being bullied (Conti-Ramsden, Durkin, Simkin, & Knox, 2009; St Clair, Pickles, Durkin, & Conti-Ramsden, 2011). Lastly, children with language disorders are also at a heightened risk of exhibiting externalizing problems and antisocial conduct disorders (Beitchman, Wilson, Johnson, et al., 2001; Conti-Ramsden & Botting, 2004).

## *Restating Information Test*

*Why is restating information important to assess?*

When children are asked to listen to and then retell a story in their own words, they are providing an oral narrative by retelling past events from their own perspective using chronological and causal sequences of events (Gillam & Pearson, 2004; Burdelski & Evaldsson, 2019; Takagi, 2019). This story retell task provides clinicians with narrative samples that are important to include in a comprehensive speech and language assessment because these skills are closely related to later reading comprehension (Griffin, Hemphill, Camp, & Wolf, 2004), academic achievement (Fazio, Naremore, & Connel, 1996), and performance on norm-referenced assessments of language (Ebert & Scott, 2014; Scott & Windsor, 2000).

Children's ability to recall the sequence of events relies largely on the way the events were originally encoded. When children are presented with a causal sequence, they are more likely to remember an event (van den Broek, 1997). The encoding process develops and grows over time. For example, when children are around 4 years of age, they can label salient details, at 5 years of age, they begin to include some temporal sequence of events, and at 6 years old children begin to discuss causal relationships (Bishop & Donlan, 2005). Later, around 10 years old or older, children begin to include psychological causality and characters' motivations. Research has suggested that when causality information is encoded, the story is more resistant to forgetting than when compared to a fragmented series of details (Bishop & Donlan, 2005).

When documenting a child's oral narratives, clinicians have the opportunity to examine vocabulary, grammar, and narrative organizational skills (Westby, 2005). Microstructural analyses can take a look at children's grammatical and syntactic abilities and can be analyzed through mean length of utterance (Miller, 1981) and sentence complexity (Nippold, Hesketh, Duthie, & Mansfield, 2005; Schuele & Tolbert, 2001). Children's vocabulary can also be analyzed by calculating lexical diversity and number of different words (Miller & Klee, 1995). Macrostructural analyses can investigate how children relate concepts. These analyses assume the setting and episode system where the setting provides background information about the characters and their environments and the episode systems includes a problem, solution, and conclusion (Mandler & Johnson, 1977; Rumelhart, 1975; Stein & Glenn, 1979).

Children with language impairment may have difficulty using appropriate vocabulary and grammar when telling stories and difficulty with text-level organization of narratives (Pearce, McCormack, & James, 2003; Reilly, Losh, Bellugi, & Wulfeck, 2004). For example, if a child has difficulty with vocabulary and grammar, it will be difficult for him/her to produce fully competent utterances and if the child has impaired macrostructural skills, he/she will have difficulty generating coherent and age-appropriate extended discourse (Heilmann, Miller, Nockerts, & Dunaway, 2010).

## *Following Directions Test*

*Why is following directions important to assess?*

In the classroom, students are constantly receiving information and being asked to follow instructions (both auditorily and visually) from their teachers. A child's ability to understand and follow verbal directions is a fundamental developmental skill that is necessary to learn and succeed in the classroom (Gill, Moorer-Cook, Armstrong, & Gill, 2012). Following verbal instructions requires many interrelated skills such as the ability to hear the instruction, understand the vocabulary and comprehend the syntax,

and utilize working memory (MacDonald & Christiansen, 2002; Alloway, Gathercole, Willis, & Adams, 2004). The ability to comprehend directions is a skill that is often used to determine receptive language difficulties (Catts, Fey, Tomblin, & Zhang, 2002; Mainela, Evans, & Coady, 2008; Seigner-Gardner & Schwartz, 2008), whereas the ability to follow spoken directions is a skill that could be used to indicate auditory processing or receptive language difficulties (Ferguson, Hall, Riley, & Moore, 2011). In order to provide appropriate assessment and intervention to our students, is important to understand the cognitive processes and language factors that are required for these verbal tasks (Archibald, 2013).

Research has demonstrated that a child's ability to understand sentences of increasing length does not always relate to syntactic maturity (Nippold, 2007). For example, many structures may increase the complexity of language (e.g., subordinate clauses, participle phrases) without actually increasing the length of the sentence. Robertson and Joanisse's (2010) study demonstrated that sentence length as well as syntactic complexity may impact a child's ability to comprehend a spoken sentence. Using a picture pointing task, Robertson and Joanisse (2010) found that typically developing children, children with dyslexia, and children with language impairment had more difficulty processing longer versus shorter sentences. Additionally, the study showed that children with language impairment had more difficulty processing sentences with passive versus active voice. Lastly, the researchers found an interaction effect across all groups where children had more difficulty processing syntactically complex sentences that were in longer versus shorter sentences. Thus, it can be presumed that children with language impairments may have greater difficulty following directions as they become increasingly longer or more syntactically complex.

When we consider working memory, sometimes, the informational load a child is given can be too much for what his/her working memory can handle at that given moment. This can lead to information loss because the student cannot hold that much information in their working memory. When this happens, working memory performance can negatively impact a student's ability to follow directions (Bergman-Nutley & Klingberg, 2014). Allen and Waterman (2015), suggest that in order to assist students, we can ask students to immediately act on the received information. The ability to recall instructions increases when the student is asked to do so immediately after instruction. A second strategy to assist students is to use different forms of instructions (e.g., written, verbal, visual) (Mayer, 2008).

## *Morphology and Sentence Structure Test*

*Why is morphology and sentence structure important to assess?*

Beginning as early as preschool and continuing into the school-age years, children are required to listen to information that frequently uses complex syntax. Additionally, children are expected to use complex syntax when they speak. Complex syntax involves utterances that contain more than one clause, through coordination or subordination (Quirk, Greenbaum, Leech, & Svartik, 1985). For typical language learners, complex syntax production begins shortly after children begin to combine words and continues to develop rapidly across the preschool years into the school-age years (Barako Arndt & Schuele, 2013). Preschool-age children begin with acquiring grammatical morphemes and other basic clausal structures (simple sentences). Research has demonstrated that children with speech or language impairment (SLI) produce fewer instances of complex syntax (Marinellie, 2004) and may leave out required grammatical elements (e.g., subject relative markers, nonfinite to markers) (Barako Arndt & Schuele, 2012; Owen & Leonard, 2006; Schuele & Dykes, 2005).

As expected, a child's ability to understand and use complex syntax will influence academic success (Scott & Windsor, 2000). For example, complex syntax is required to engage in classroom discourse,

answer questions, summarize and explain information, and also used for written expression and used socially in conversations. For some early talkers, complex syntax may emerge by 2 years of age (Diessel, 2004). Typically, children are regularly using complex syntax between their second and third birthdays and are capable of using a variety of complex syntax types by the time they begin kindergarten (Bloom, Tackeff, & Lahey, 1984). Complex syntax production continues to expand and grow throughout the school-age years in order to meet classroom demands and communicative expectations. If syntax production is not appropriately assessed and treated early on, children may not be able to meet the language comprehension and production demands found in kindergarten or first grade (Barako Arndt & Schuele, 2013).

Researchers have suggested that conversational samples can be used successfully to assess children's language production abilities. For example, play-based strategies can be used with preschoolers (e.g., play house, farm), topics of interest (e.g., movies, sports, school activities) can be used with early elementary school-age children, and a variety of discourse tasks (e.g., conversation, narrative, expository) can be used with older children (Hadley, 1998; Barako Arndt & Schuele, 2013). Children can be asked to describe or to explain how to complete a task such as a cooking recipe or playing a game (Nippold, 2010) or to summarize a video (Scott & Windsor, 2000).

## Administration and Scoring Procedures

The following testing guidelines represent specific administration and scoring procedures for the *Language Video Assessment Tool*. These procedures are considered best professional practice required in any type of assessment as described in the Standards for Educational and Psychological Testing (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education [AERA, APA, and NCME], 2014).

### *Examiner Qualifications*

Professionals who are formally trained in the ethical administration, scoring, and interpretation of assessment tools and who hold appropriate educational and professional credentials may administer the *Language Video Assessment Tool*. Qualified examiners include speech-language pathologists and clinical fellows in speech language pathology. It is a requirement to read and become familiar with the administration, recording, and scoring procedures before using this assessment.

### *Confidentiality Requirements*

As described in Standard 6.7 of the Standards for Educational and Psychological Testing (AERA et al., 2014), it is the examiner's responsibility to protect the security of all testing material and ensure confidentiality of all testing results.

### *Target Population for Testing*

The standardization process undertaken by the *Language Video Assessment Tool* allows it to be used for individuals between the ages of 5-18. The *Language Video Assessment Tool* provides information regarding an individual's spoken language comprehension, oral expression and language integration. Students with these difficulties will be brought to the attention of speech-language pathologists, school psychologists, teachers, parents, reading specialists and others who are involved with the academic and social impact of language impairments.

The *Language Video Assessment Tool* can be used to identify language impairment, help aid in the eligibility criteria needed for special education services or can be used to provide a description of current language skills. The target populations for this assessment are provided below:

- Students who have been previously diagnosed or are suspected of having a spoken language

comprehension or expressive language disorder (also known as specific language impairment, developmental language disorder, speech or language impairment, or language learning disability). This assessment can help provide criteria for a language impairment diagnosis and/or eligibility.

- ➔ Students suspected of having a learning disability in the area of oral or written language (also known as specific learning disability, language-based learning disability, or language learning disability). This assessment can help provide criteria for language impairment diagnosis and/or eligibility.
- ➔ Students with known diagnoses, such as intellectual disability, autistic spectrum disorder, intellectual disorder, and traumatic brain disorder. This assessment can help provide a description of current language skills.
- ➔ Students with known difficulty of language, literacy, or social communication skills that have not met criteria for a formal diagnosis but are receiving support services. This assessment can help provide a description of current language skills.
- ➔ Students in any of the above groups, who have been previously assessed with *The Language Video Assessment Tool*, can also benefit with a follow-up test for the purpose of tracking progress. Note: Follow-up assessments should take place at least 6-months or later after the previous assessment date.

## *Testing Time*

Administration of the test takes approximately 40-50 minutes.

## *Additional Testing Considerations and Procedures*

- A. Seating arrangement is important when administering this test because both the examiner and the student need to be able to see the videos. The examiner must be able to face the student during testing in order to closely observe his/her use of articulation.
- B. Administer the test in a quiet, comfortable environment with no distractions. Stop testing if the student appears to be tired or is unwilling to participate.
- C. It is important to elicit the examinees' best effort on each test and on each item presented. This can be achieved by establishing rapport with the examinee before the testing begins and by providing praising prompts when needed.
- D. Because this is not a timed test, examinees should be allowed time to respond. However, if no response is provided within 10 seconds of presentation of an item, the clinician should prompt the examinee to imitate the target word.
- E. If the examiner has reasons to believe that the testing results are invalid, such as poor attention span that is noticeably different from those expected, or student showing sign of being ill, retest at a later time.

## **Morphology**

### *Repetition of Video Test Items*

Repetition of videos is allowed up to two times.

### *Repetition of Item Questions*

Repetition of item questions is allowed when the examinee appears to not understand the question or requests a repetition. If the examinee does not provide a response after the second reading, score the test item as a “0” and proceed to the next test item.

### *Prompting Rules*

*The Morphology and Sentence Structure* test items were designed to be easily recognizable by young children and older students. However, when responses are ambiguous or other than the target word, the examiner should attempt to elicit the target response by repeating the test item question. If the examinee does not provide a response after the second reading, score the test item as a “0” and proceed to the next test item.

## **Language Comprehension**

### *Repetition of Video Test Items*

Repetition of videos is not allowed unless it is apparent that the background noise interferes with comprehension of video content.

### *Repetition of Item Questions*

One repetition of each item question is allowed when the examinee appears to not understand the question or requests a repetition. If the examinee does not provide a response after the second reading, proceed to the next question.

### *Prompting Rules*

If the initial response to a test item is ambiguous, the examiner should repeat the question. If the examinee does not provide a response after the repetition, the examiner should proceed to the next test item.

## **Restating information**

### *Repetition of Video Test Items*

Repetition of videos is not allowed unless it is apparent that the background noise interferes with comprehension of video content.

## Prompting Rules

If the examinee does not provide a sufficient response or does not offer a sufficient amount of information and details, the examiner should prompt by saying, “Tell me more” or “Tell me anything you remember from the video.”

### Following Directions

#### *Repetition of Item Questions/ Prompting Rules*

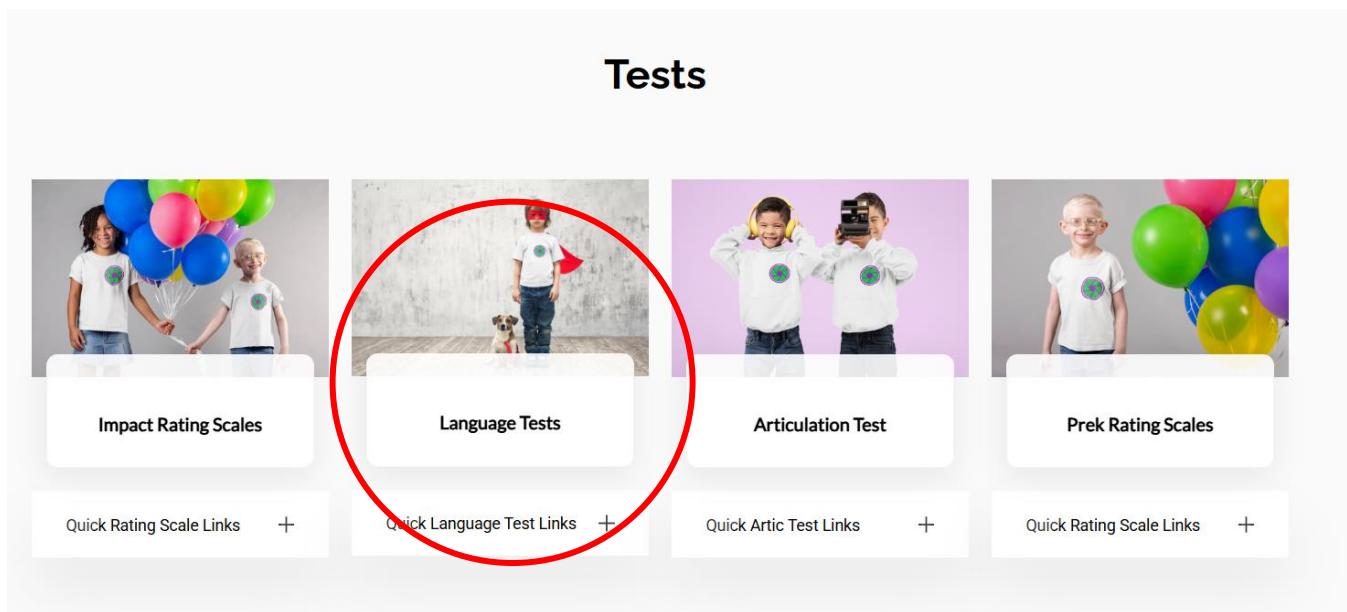
Repetition of item questions is allowed when the examinee appears to not understand the question or requests a repetition. If the examinee does not follow the directive after the second reading, score the test item as a “0” and proceed to the next test item.

## Test Materials

The *Language Video Assessment Tool* consists of four independent tests: Language Comprehension, Restating Information, Following Directions and Morphology & Sentence Structure. All video-based test items, printable and digital protocols, and scale converting software is available online at: [www.SLPplatform.com](http://www.SLPplatform.com)

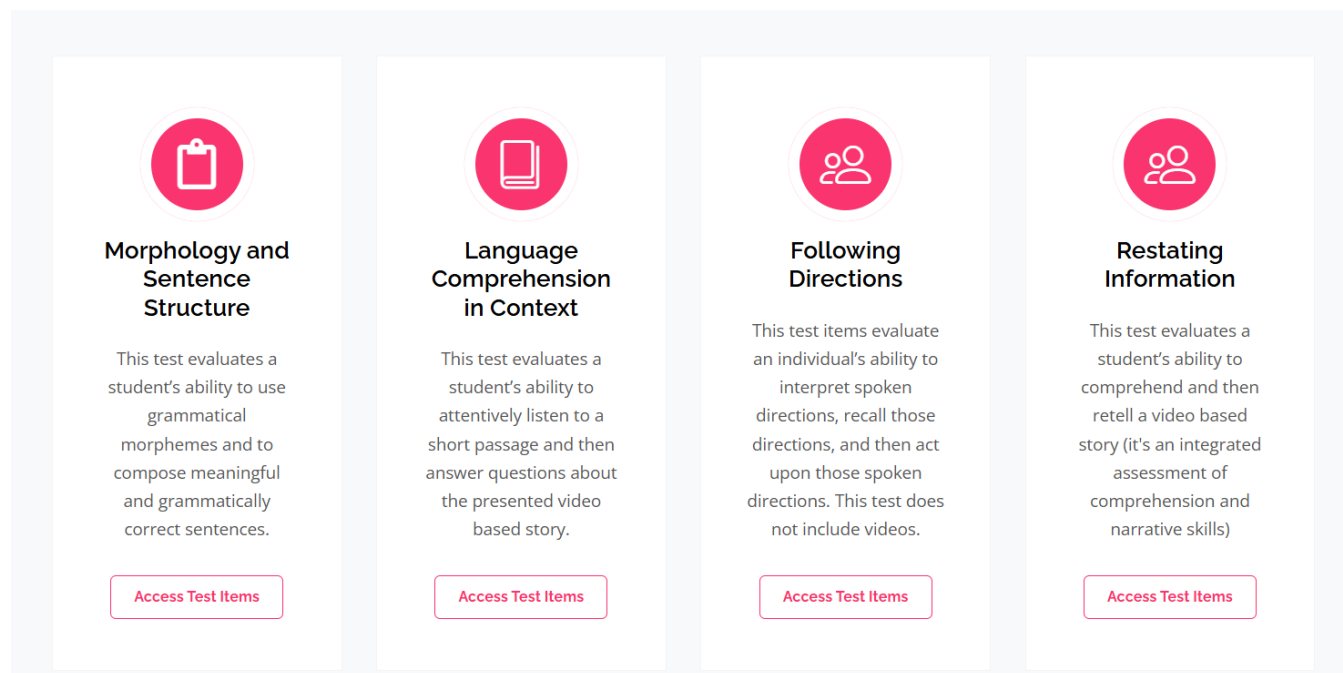
## Administration Instructions

Begin by logging onto your account online: [www.SLPplatform.com](http://www.SLPplatform.com). Next, select the “Administer Tests” tab. Select the *Language VAT* by clicking on the picture.



## Administration Instructions

**Step 1:** After you have selected the *Language VAT*, select the name of the test you would like to administer first,



The image displays a grid of four test options, each with a red circular icon, a title, a description, and an 'Access Test Items' button.

- Morphology and Sentence Structure:** This test evaluates a student's ability to use grammatical morphemes and to compose meaningful and grammatically correct sentences.
- Language Comprehension in Context:** This test evaluates a student's ability to attentively listen to a short passage and then answer questions about the presented video based story.
- Following Directions:** This test items evaluate an individual's ability to interpret spoken directions, recall those directions, and then act upon those spoken directions. This test does not include videos.
- Restating Information:** This test evaluates a student's ability to comprehend and then retell a video based story (it's an integrated assessment of comprehension and narrative skills).

**Step 2:** Once the assessment loads, there will be two protocol options: digital and printable. When using the digital protocol option, you will need to use two devices to administer the test. One device is required to record the responses online. The second device is required to play the video-based test items. If clinicians do choose the printable protocol, the results will have to be transferred to the digital protocol after completing the assessment online to obtain the raw scores automatically. Transferring data from the hardcopy protocol to the digital protocol is a quick and easy process and should take no more than five minutes.

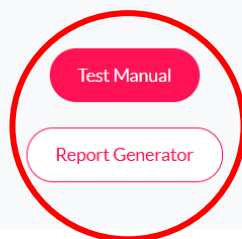
Use the videos to administer the test. When you are finished with the administration of the test along with the completion of the protocol, click on the "Submit" button. The system will generate a scored protocol that contains standard scores and percentile ranks. Enter your (the examiner's) email address to receive a copy of the protocol. Lastly, use the optional report generator to assist you in writing the report for the *Language VAT* (see picture below).

# Language Video Assessment Tool

The Language Video Assessment Tool (VAT) is a standardized contextualized language testing battery for children and young adults ages 6 through 18 years old. It is composed of four stand-alone tests. It is an accurate and reliable assessment tool that provides valid results on language

comprehension, story retell, following directions, and morphology and sentence structure. Normative data of this test is based on a nationally representative sample of 1554 (typically developing) children and young adults in the United States.

The test is composed of four independent and stand-alone tests: (a) Language Comprehension in Context, (b) Restating Information, (c) Following Directions, and (d) Morphology and Sentence Structure.



## Step 3: Instructions for each test:

### *Language Comprehension in Context*

This test does not require a trial test item. Instead, the examinee is asked to repeat what they are being asked to do. Please ensure that the student understands that they are being asked to watch videos and answer questions based on the videos. At the beginning of the test, the clinician explains the test to the examinee by saying, *"You are about to watch some videos about nature. Please watch and listen carefully. You will be allowed to watch each video only one time. I will ask you questions about each video. Please do your best to answer the questions. You can ask me to repeat the question. I will be able to repeat the question only one time. If you don't know or can't remember the answer, it's okay to say, 'I don't know' or 'I can't remember.' So please tell me now, what are you supposed to do?"* Then the clinician will play the video, and the examinee will be asked questions about what happened/what was discussed in the video clip.

Ceiling Rule for the "BEES" video section: 6 consecutive "0" scores. Proceed to the "SEALIFE" videos after 6 consecutive "0" scores.

Ceiling Rule for the "SEALIFE" video section: Discontinue administering the test after 6 consecutive "0" scores. Please note that this form does not allow you to "unclick" choices.

### *Following Directions Test*

At the beginning of the test, the clinician explains the test to the examinee by saying, *"I am going to show you some pictures and ask you to draw some things. First, I want you to listen while I ask you to do something. Then, after I say 'go,' you can follow the instructions and draw. I can repeat the instructions for you one time if you need me to. So, can you please tell me what you are supposed to do now?"*

Scoring: Clinicians must score each test item as "1" when it is executed correctly. All test directives executed out of order or incorrectly must be scored as a "0".

Ceiling Rule for "Executing Directions" section: 5 consecutive "0" scores. Proceed to the "Following Verbal Directions" part after 5 consecutive "0" scores.

Ceiling Rule for "Verbal Directions" section: Discontinue administering the test after 5 consecutive "0" scores. Please note that this form does not allow you to "unclick" choices.

### *Restating Information*

At the beginning of the test, the clinician explains the test to the examinee by saying, ***"You are going to watch some videos. Please watch and listen carefully. You will watch the video only one time. After you are done watching, I need you to tell me what the videos are about and all the details that you can remember. So, tell me, what are you supposed to do now?"*** (Please ensure that the examinee understands that they are being asked to watch videos and answer questions based on the video). Proceed to the first video. Once the video finishes playing, say, "Now tell what the video was about and all the details you can remember".

Prompting: If the student does not provide a sufficient response or does not offer a sufficient amount of information and details, say, "Tell me more" or "Tell me anything you remember from the video."

Basal/Ceiling Rule: There is no basal/ceiling rule on this test. Please note that this form does not allow you to "unclick" choices.

### *Morphology and Sentence Structure*

Once the assessment loads, there will be two viewing options available. *Option A* allows you to use buttons to navigate through videos. *Option B* allows you to view videos individually. Both options contain the same videos and test items, choose the option you prefer. For example, you may prefer *Option B* if the test is being administered over the course of a few days.

At the beginning of the test, the clinician explains the test to the examinee by saying, ***"You are going to watch some videos. After watching each video, you will be asked to answer a question about the video or you will be asked to complete a sentence about the video. Let's try one."*** Please play the trial video test item. Allow the student to answer. If the student doesn't answer correctly, say, ***"He is reading."*** Proceed with the test items. If needed, you may repeat showing the videos up to two times. Correct test item answers are provided for clinicians' reference.

Basal/Ceiling Rule: None. Please administer all test items. Please note that this form does not allow you to "unclick" choices.

## Standardization and Normative Information

This section describes the procedures followed in developing test items, implementing the pilot and normative study, and selecting the items for the final version of the test. This section also details the normative samples obtained to standardize and validate the *Language VAT*. All test development and standardization project procedures were reviewed and approved by IntegReview IRB (now known as Advarra), a fully AAHRPP-accredited independent review board that provides ethical review for all phases of industry-sponsored and federally funded research in the U.S. Additionally, all test development and standardization methodology was based on best practices in research, and conducted in compliance with complex regulatory requirements, frameworks, and guidelines set forth by the Standards for Educational and Psychological Testing (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education [AERA, APA, and NCME], 2014).

### *Test Item Development*

The words chosen for the *Language VAT* represent concepts that are unambiguous and easily recognizable in video format, that are used to elicit and measure target concepts. Selection of the target concept inventory began with a review of research and theory related to the development of language error patterns as well as an analysis of which morpho-syntactic errors are most predictive of DLD for specific age groups. The selected test items were designed to be developmentally appropriate for use with young children and older students. The interactive format of videos minimizes the reluctance of many young children to speak to an unfamiliar examiner. Additionally, the test items and their videos were chosen to be clear and easy to recognize for young children. The New General Service List (Browne et. al, 2013) and the Reading Teacher's Book of Lists, Fifth Edition (Fre et. al, 2006) were used to ensure that only high-frequency and commonly used words were included in the test item inventory.

The test was developed in three phases: pilot study, normative study, and national standardization. The procedures for each phase are detailed below.

## *Pilot Study*

The pilot study was conducted to determine the appropriateness of all video test stimuli and to review all test instructions. The purpose of the study was to determine how readily children of varying ages could name the target words portrayed in the presented videos.

The pilot study included 126 children from the ages of 5:0 to 12:11. The sample was 23% Hispanic, 9% African American, 51% White, 4% Asian and 13% other ethnicities (60% males and 40% females). The pilot study included 75% typically developing children and 25% children with identified DLD.

The examinee responses were coded as correct, prompted (correct with verbal prompts), imitated (correct after imitation) or incorrect. At that time, the morpho-syntactic errors were not tracked. The results of the pilot study were found to be effective for test item selection and for the interactive aspect of the video-based format.

Item analyses were implemented based on Classical Test Theory (CTT) and Item Response Theory (IRT) which are psychometric tools used to refine and evaluate test items to ensure that they effectively elicit target words. Both CTT and IRT are foundational frameworks in psychometrics that emphasize the importance of test standardization. The CTT analyses reviewed the proportion of children answering the items correctly as well as the correlation of item performance with raw score. Additionally, all test items were analyzed using the Rasch one-parameter model. While CTT assumes that all items in an assessment instrument make an equal contribution to the performance of examinees, IRT takes into the consideration the fact that some items are more difficult than others. This means that the probability of success on items is due both to student ability and also to item difficulty. As a result of these analyses, some items were eliminated and items that were identified to be difficult to name for certain age groups, were assigned to the older examinee group (10:0-12:11).

## *Normative Study*

Following the pilot study, a normative study was conducted to establish norms for the Language VAT by testing typically developing children representative of the general U.S. population. A clinical group was included for validation purposes. Additional goals of the normative study included investigation of optimal weighted scoring system/criteria as well as optimal test administration time. The study reviewed administrative and scoring procedures preliminary to national standardization. The test content was evaluated both qualitatively and quantitatively for bias.

The normative study included 206 children from the ages of 6:0 to 15:11. The sample was 17% Hispanic, 9% African American, 52% White, 6% Asian and 16% other ethnicities (60% males and 40% females). The pilot study included 88% typically developing children and 12% children with identified DLD.

The goals of the normative study were achieved. Since a language test is designed to identify those examinees with DLD, it would be expected that individuals identified as likely to exhibit language deficits would score lower than those who are typically developing. The mean for the outcome variables were compared between the clinical and the typically developing groups of examinees using Kruskal Wallis analysis of variance (ANOVA). Further comparisons in mean scores between the groups were

examined using Mann-Whitney U test. The level of significance was set at  $p \leq 0.05$ . Further comparisons using Mann-Whitney U test showed that there was a significant difference among all the study groups ( $p < 0.001$ ).

Based on the responses of all examinees, some test items were modified, while others were removed altogether. The test directions and scoring procedures were fine-tuned. Suggestions of the field test examiners were thoroughly reviewed prior to the national standardization.

### *National Standardization*

One of the ways we can tell if an assessment is a strong test, is if it includes adequate norms. Norm-referenced testing is a method of evaluation where an individual's scores on a specific test are compared to scores of a group of test-takers (e.g., age norms) (AERA, APA, and NCME, 2014). Previous research has suggested that utilizing a normative sample can be beneficial in the identification of a disability. Additionally, research has suggested that the inclusion of children with disabilities in the normative sample may negatively impact the test's ability to differentiate between children with disorders and children who are typically developing (Peña, Spaulding, & Plante, 2006). When reviewing a test's normative sample, it is important to consider size, gender, race and ethnicity, age, geographic location, and whether individuals with disabilities were included in the normative sample.

The normative data for the *Language Video Assessment Tool* is based on the performance of 1554 examinees across 11 age groups (shown in Table 4.1) from 17 states across the United States of America (Arizona, California, Colorado, Nevada, Idaho, Illinois, Iowa, Kansas, Ohio, Minnesota, Florida, New York, Pennsylvania, Florida, South Carolina, Texas, Washington).

| <b>Age Group</b> | <b>Age</b>    | <b>N</b> | <b>%</b> |
|------------------|---------------|----------|----------|
| <b>1</b>         | 5-0 to 5-11   | 163      | 8.4      |
| <b>2</b>         | 6-0 to 6-11   | 142      | 8.7      |
| <b>3</b>         | 7-0 to 7-11   | 151      | 9.4      |
| <b>4</b>         | 8-0 to 8-11   | 139      | 9.9      |
| <b>5</b>         | 9-0 to 9-11   | 134      | 9.1      |
| <b>6</b>         | 10-0 to 10-11 | 129      | 8.5      |
| <b>7</b>         | 11-0 to 11-11 | 137      | 8.2      |
| <b>8</b>         | 12-0 to 12-11 | 119      | 8.4      |
| <b>9</b>         | 13-0 to 13-11 | 141      | 9.0      |
| <b>10</b>        | 14-0 to 14-11 | 136      | 9.4      |
| <b>11</b>        | 15-0 to 18-0  | 163      | 11.0     |
| <b>Total</b>     |               | 1554     | 100%     |

The data was collected throughout the 2016-2020 school years by 34 state licensed speech-language pathologists (SLPs). The SLPs were recruited through Go2Consult Speech and Language Services, a speech-language pathology services and nonpublic agency certified by the CA Department of Education in conjunction with the Lavi Institute, an ASHA approved CE provider. All standardization project procedures were reviewed and approved by IntegReview IRB (now known as Advarra), a fully AAHRPP-accredited independent review board that provides ethical review for all phases of industry-sponsored and federally funded research in the U.S. To ensure representation of the national population, the *Language Video Assessment Tool* standardization sample was selected to match the US Census data reported in the ProQuest Statistical Abstract of the United States (ProQuest, 2017). The sample was stratified within each age group by the following criteria: gender, race or ethnic group, and geographic region. The demographic table below (Table 4.2) specifies the distributions of these characteristics and shows that the normative sample is nationally representative.

### *Criteria for inclusion in the normative sample*

A strong assessment is one that provides results that will benefit the individual being tested or society as a whole (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education [AERA, APA, and NCME], 2014). One way we can tell if an assessment is strong, is if the test includes adequate norms. Previous research has suggested that utilizing a normative sample can aid in the identification of a disability. Research has also suggested that the inclusion of children with disabilities may negatively impact the test's ability to differentiate between children with disorders and children who are typically developing (Peña, Spaulding, & Plante, 2006). Since the purpose of the *Language Video Assessment Tool* is to help to identify students who present with language disorders, it was critical to exclude students from the normative sample who have diagnoses that are known to influence language abilities (Peña, Spaulding, & Plante, 2006). Students who had previously been diagnosed with spoken language comprehension and/or spoken language disorders, auditory processing disorders, and articulation or phonological impairments were not included in the normative sample. Further, students were excluded from the normative sample if they were diagnosed with autism spectrum disorder, intellectual disability, hearing loss, neurological disorders, or genetic syndromes. In order for students to be included in the normative sample for this assessment tool, students must have met criteria of having typical language development, and show no evidence of language deficits. Thus, the normative sample for the *Language Video Assessment Tool* provides an appropriate comparison group (i.e., a group without any known disorders that might affect language abilities) against which to compare students with suspected disorders.

The *Language Video Assessment Tool* is designed for students who are native speakers of English and/or are English language learners (ELL) who have demonstrated a proficiency in English based on state testing scores and school district language evaluations. Additionally, students who were native English speakers and also spoke a second language were included in this sample.

Norm-referenced testing is a method of evaluation where an individual's scores on a specific test are compared to scores of a group of test-takers (e.g., age norms) (AERA, APA, and NCME, 2014). Clinicians can compare clinician, teacher, and parent ratings on the *Language Video Assessment Tool* to this normative sample to determine whether a student is scoring within normal limits or, if their scores are indicative of a language disorder. Administration, scoring, and interpretation of the *Language Video Assessment Tool* must be followed in order to make comparisons to normative data. This manual provides instructions to guide examiners in the administration, scoring, and interpretation of the assessment results.

**Table 4.2****Demographics of the Normative Sample vs. US Population****Normative Sample Size = 1554**

| <b>Demographic</b>                | <i>N</i> Normative Sample | % Normative Sample | % US Population |
|-----------------------------------|---------------------------|--------------------|-----------------|
| <b>Gender</b>                     |                           |                    |                 |
| Male                              | 770                       | 49.5%              | 49%             |
| Female                            | 784                       | 50.5%              | 51%             |
| <b>Total</b>                      | 1554                      | 100%               | 100%            |
| <b>Race</b>                       |                           |                    |                 |
| White                             | 963                       | 62%                | 77%             |
| Black                             | 233                       | 15%                | 13%             |
| Asian                             | 78                        | 5%                 | 4%              |
| Hispanic                          | 202                       | 13%                | 12%             |
| Other                             | 78                        | 5%                 | 6%              |
| <b>Total</b>                      | 1554                      | 100%               | 100%            |
| <b>Clinical Groups</b>            |                           |                    |                 |
|                                   | none                      | none               | none            |
| <b>US Regions</b>                 |                           |                    |                 |
| Northeast                         | 279                       | 18%                | 16%             |
| Midwest                           | 295                       | 19%                | 22%             |
| South                             | 528                       | 34%                | 38%             |
| West                              | 452                       | 29%                | 24%             |
| <b>Total</b>                      | 1554                      | 100%               | 100%            |
| <b>Parents' Educational Level</b> |                           |                    |                 |
| Four years of college or more     | 466                       | 30                 | 31%             |
| Some college                      | 404                       | 26                 | 27%             |
| High school graduate              | 482                       | 31                 | 30%             |
| Less than high school graduate    | 202                       | 13                 | 12%             |
| <b>Total</b>                      | 1554                      | 100%               | 100%            |

## Validity and Reliability

This section of the *Language Video Assessment Tool* manual provides information on the psychometric characteristics of validity and reliability. Validity helps establish how well a test measures what it is supposed to measure and reliability represents the consistency with which an assessment tool measures a certain ability or skill. The first half of this chapter will evaluate content, construct, criterion, and clinical validity of the *Language Video Assessment Tool*. The latter half of the chapter will review the consistency and stability of the *Language Video Assessment Tool* scores, in addition to test retest and inter-rater reliability.

### *Validity*

Validity is essential when considering the strength of a test. Content validity refers to whether the test provides the clinician with accurate information on the ability being tested. Specifically, content validity measures whether or not the test actually assesses what it's suppose to. According to McCauley and Strand (2008), there should be a rationalization of the methods used to choose content, expert evaluation of the test's content, and an item analysis.

Content-oriented evidence of validation addresses the relationship between a student's learning standards and the test content. Specifically, content-sampling issues look at whether cognitive demands of a test are reflective of the student's learning standard level. Additionally, content sampling may address whether the test avoids inclusion of features irrelevant to what the test item is intended to target.

### *Single-cut Scores*

It is common to use single cut scores (e.g., -1.5 standard deviations) to identify disorders, however, there is evidence that advises against using this practice (Spaulding, Plante, & Farinella, 2006). When using single cut scores (e.g., -1.5 SD, -2.5 SD, etc.), we may under identify students with impairments on tests for which the best-cut score is higher and over identify students' impairments on tests for which the best-cut score is lower. Additionally, using single cut scores may go against IDEA's (2004) mandate, which states assessments must be valid for the purpose for which they are used.

## Inclusion/Exclusion Criteria for the Discriminant Analysis and the Group Differences Study

Typically developing participants were selected based on the following criteria: 1) exhibited hearing sensitivity within normal limits; 2) presented with age-appropriate speech and language skills; 3) successfully completed each school year with no academic failures; and 4) attended public school and placed in general education classrooms.

Inclusion criteria for the developmental language disorder - language comprehension group was: 1) having a current diagnosis of developmental language disorder - language comprehension impairment (based on medical records and/or school-based special education eligibility criteria); 2) being enrolled in the general education classroom for at least 4 hours per day; and 3) exhibited hearing sensitivity within normal limits.

Finally, the inclusion criteria for the developmental language disorder - expressive language impairment group was: 1) having a current diagnosis of a developmental language disorder - expressive language impairment or delay (based on medical records and/or school-based special education eligibility criteria); 2) being enrolled in the general education classroom for at least 4 hours per day; and 3) exhibited hearing sensitivity within normal limits.

### *Sensitivity and Specificity*

Table 5.1 shows the cut scores needed to identify language disorders within each age range. Additionally, this table demonstrates the sensitivity and specificity information that indicates the accuracy of identification at these cut scores. Sensitivity and specificity are diagnostic validity statistics that explain how well a test performs. Vance and Plante (1994) set forth the standard that for a language assessment to be considered clinically beneficial, it should reach at least 80% sensitivity and specificity. Thus, strong sensitivity and specificity (i.e., 80% or stronger) is needed to support the use of a test in its identification of the presence of a disorder or impairment. Sensitivity measures how well the assessment will accurately identify those who truly have a language disorder (Dollaghan, 2007). If sensitivity is high, this indicates that the test is highly likely to identify the language disorder, or, there is a low chance of “false positives.” Specificity measures the degree to which the assessment will accurately identify those who do not have a language disorder, or how well the test will identify those who are “typically developing” (Dollaghan, 2007).

**Table 5.1 Language Video Assessment Tool sensitivity, specificity and likelihood ratios****Language Comprehension Test**

| Age group         | Cut score | Sensitivity | Specificity | Positive likelihood ratio | Negative likelihood ratio |
|-------------------|-----------|-------------|-------------|---------------------------|---------------------------|
| <b>5:0-5:11</b>   | 77        | .87         | .88         | 4.04                      | .09                       |
| <b>6:0-6:11</b>   | 77        | .81         | .94         | 5.05                      | .11                       |
| <b>7:0-7:11</b>   | 77        | .91         | .83         | 4.02                      | .23                       |
| <b>8:0-8:11</b>   | 78        | .88         | .81         | 4.12                      | .41                       |
| <b>9:0-9:11</b>   | 77        | .84         | .92         | 4.08                      | .23                       |
| <b>10:0-10:11</b> | 77        | .92         | .91         | 5.42                      | .16                       |
| <b>11:0-11:11</b> | 78        | .91         | .89         | 6.07                      | .06                       |
| <b>12:0-12:11</b> | 77        | .88         | .92         | 4.06                      | .23                       |
| <b>13:0-13:11</b> | 77        | .89         | .83         | 5.71                      | .18                       |
| <b>14:0-14:11</b> | 78        | .93         | .90         | 4.03                      | .26                       |
| <b>15:0-15:11</b> | 78        | .89         | .91         | 6.11                      | .08                       |
| <b>16:0-21:0</b>  | 78        | .94         | .96         | 4.23                      | .21                       |

**Restating Information Test**

| Age group         | Cut score | Sensitivity | Specificity | Positive likelihood ratio | Negative likelihood ratio |
|-------------------|-----------|-------------|-------------|---------------------------|---------------------------|
| <b>5:0-5:11</b>   | 77        | .88         | .91         | 4.04                      | .09                       |
| <b>6:0-6:11</b>   | 77        | .89         | .87         | 4.03                      | .14                       |
| <b>7:0-7:11</b>   | 77        | .92         | .86         | 4.34                      | .13                       |
| <b>8:0-8:11</b>   | 77        | .89         | .93         | 5.04                      | .12                       |
| <b>9:0-9:11</b>   | 77        | .92         | .91         | 4.84                      | .15                       |
| <b>10:0-10:11</b> | 77        | .86         | .84         | 4.04                      | .18                       |
| <b>11:0-11:11</b> | 78        | .81         | .87         | 4.01                      | .32                       |
| <b>12:0-12:11</b> | 77        | .92         | .91         | 5.67                      | .08                       |
| <b>13:0-13:11</b> | 77        | .88         | .86         | 4.04                      | .34                       |
| <b>14:0-14:11</b> | 78        | .84         | .92         | 4.23                      | .23                       |
| <b>15:0-15:11</b> | 77        | .84         | .88         | 6.72                      | .13                       |
| <b>16:0-21:0</b>  | 77        | .82         | .92         | 5.12                      | .15                       |

*Note: Age groups 16:0-21:0 are reported together as there were no age-related changes detected after the age of 16. Total N=3037; typically developing group n=1554; clinical group=1483*

**Table 5.1 Language Video Assessment Tool sensitivity, specificity and likelihood ratios****Following Directions Test**

| Age group         | Cut score | Sensitivity | Specificity | Positive likelihood ratio | Negative likelihood ratio |
|-------------------|-----------|-------------|-------------|---------------------------|---------------------------|
| <b>5:0-5:11</b>   | 77        | .88         | .91         | 4.03                      | .08                       |
| <b>6:0-6:11</b>   | 77        | .91         | .90         | 4.11                      | .11                       |
| <b>7:0-7:11</b>   | 78        | .88         | .84         | 4.23                      | .21                       |
| <b>8:0-8:11</b>   | 77        | .86         | .83         | 4.21                      | .09                       |
| <b>9:0-9:11</b>   | 78        | .94         | .85         | 5.84                      | .11                       |
| <b>10:0-10:11</b> | 77        | .87         | .93         | 4.89                      | .23                       |
| <b>11:0-11:11</b> | 78        | .85         | .91         | 4.21                      | .31                       |
| <b>12:0-12:11</b> | 78        | .90         | .92         | 4.11                      | .46                       |
| <b>13:0-13:11</b> | 77        | .93         | .83         | 4.16                      | .08                       |
| <b>14:0-14:11</b> | 77        | .89         | .91         | 4.14                      | .12                       |
| <b>15:0-15:11</b> | 77        | .87         | .83         | 5.23                      | .24                       |
| <b>16:0-21:0</b>  | 78        | .85         | .82         | 4.56                      | .40                       |

**Morphology and Sentence Structure Test**

| Age group         | Cut score | Sensitivity | Specificity | Positive likelihood ratio | Negative likelihood ratio |
|-------------------|-----------|-------------|-------------|---------------------------|---------------------------|
| <b>5:0-5:11</b>   | 77        | .88         | .84         | 4.01                      | .09                       |
| <b>6:0-6:11</b>   | 78        | .83         | .91         | 4.10                      | .11                       |
| <b>7:0-7:11</b>   | 77        | .87         | .83         | 4.24                      | .34                       |
| <b>8:0-8:11</b>   | 77        | .91         | .80         | 5.09                      | .06                       |
| <b>9:0-9:11</b>   | 78        | .93         | .85         | 6.34                      | .23                       |
| <b>10:0-10:11</b> | 77        | .88         | .89         | 5.07                      | .12                       |
| <b>11:0-11:11</b> | 77        | .83         | .82         | 4.67                      | .08                       |
| <b>12:0-12:11</b> | 78        | .92         | .85         | 4.12                      | .12                       |
| <b>13:0-13:11</b> | 77        | .89         | .81         | 4.23                      | .11                       |
| <b>14:0-14:11</b> | 77        | .93         | .89         | 4.07                      | .09                       |
| <b>15:0-15:11</b> | 77        | .91         | .90         | 5.89                      | .08                       |
| <b>16:0-21:0</b>  | 77        | .88         | .84         | 6.11                      | .44                       |

*Note: Age groups 16:0-21:0 are reported together as there were no age-related changes detected after the age of 16. Total N=3037; typically developing group n=1554; clinical group=1483*

## Content Validity

The validity of a test determines how well the test measures what it purports to measure. Validity can take various forms, both theoretical and empirical. This can often compare the instrument with other measures or criteria, which are known to be valid (Zumbo, 2014). For the content validity of the test, expert opinion was solicited. Thirty-one speech language pathologists (SLPs) reviewed the *Language Video Assessment Tool*. All SLPs were licensed in the state of California, held the Clinical Certificate of Competence from the American Speech-Language-Hearing Association, and had at least 5 years of experience in assessment of children with spoken language comprehension, spoken, and social language disorders. Each of these experts was presented with a comprehensive overview of each test descriptions, as well as rules for standardized administration and scoring. They all reviewed 6 full-length administrations. Following this, they were asked 35 questions related to the content of the tests and whether they believed the assessment tool to be an adequate measure of language functioning. For instance, their opinion was solicited regarding whether the questions and the examinees' responses properly evaluated language comprehension and oral expression skills. The reviewers rated each test on a decimal scale. All reviewers agreed that the *Language Video Assessment Tool* is a valid standardized measure to evaluate language skills in students who are between the ages of 5 and 18 years old. The mean ratings for the Language Comprehension, Restating Information, Following Directions and Morphology & Sentence Structure tests were  $31.4 \pm 0.6$ ,  $29.3 \pm 0.4$ ,  $29.4 \pm 0.9$ ,  $30.3 \pm 0.7$ , respectively.

## Construct Validity

### *Developmental Progression of Scores*

Spoken language comprehension and spoken language is developmental in nature and skills change with age. Mean raw scores for examinees should increase with chronological age, demonstrating age differentiation. Mean raw scores and standard deviations for the *Language Video Assessment Tool* are divided into eleven age intervals displayed in Table 5.2 below.

**Table 5.2 Normative Sample's mean raw scores and standard deviations on the *Language Video Assessment Tool***

| Age Group         | Tests                  |                      |                       |                                   |
|-------------------|------------------------|----------------------|-----------------------|-----------------------------------|
|                   | Language Comprehension | Following Directions | Restating Information | Morphology and Sentence Structure |
| <b>5:0-5:11</b>   | 78 (4.1)               | 44 (3.1)             | 42 (4.1)              | 55 (2.6)                          |
| <b>6:0-6:11</b>   | 84 (2.7)               | 47 (2.9)             | 45 (3.4)              | 57 (3.1)                          |
| <b>7:0-7:11</b>   | 89 (2.5)               | 49 (3.4)             | 48 (3.9)              | 57 (3.4)                          |
| <b>8:0-8:11</b>   | 92 (2.8)               | 50 (2.8)             | 51 (2.6)              | 58 (2.9)                          |
| <b>9:0-9:11</b>   | 94 (3.1)               | 53 (2.6)             | 53 (2.4)              | 61 (2.6)                          |
| <b>10:0-10:11</b> | 95 (3.2)               | 56 (3.1)             | 55 (2.1)              | 62 (1.9)                          |
| <b>11:0-11:11</b> | 98 (2.1)               | 56 (2.7)             | 57 (2.4)              | 64 (1.7)                          |
| <b>12:0-12:11</b> | 98 (1.9)               | 57 (1.8)             | 57 (1.8)              | 64 (2.1)                          |
| <b>13:0-13:11</b> | 99 (1.4)               | 57 (1.4)             | 58 (1.4)              | 65 (1.8)                          |
| <b>14:0-14:11</b> | 100 (1.1)              | 57 (0.9)             | 60 (1.7)              | 65 (1.6)                          |
| <b>15:0-15:11</b> | 100 (0.5)              | 58 (0.6)             | 60 (1.5)              | 66 (1.4)                          |
| <b>16:0-21:0</b>  | 100 (0.3)              | 58 (0.7)             | 63 (1.7)              | 66 (1.7)                          |

## Group Differences

Since a language assessment tool is designed to identify those examinees with developmental language disorder, it would be expected that individuals identified as likely to exhibit language comprehension and/or oral expression difficulties would score lower than those who are typically developing. The mean for the outcome variables (Language Comprehension, Restating Information, Following Directions and Morphology & Sentence Structure) were compared among the two clinical groups and the typically developing group of examinees using Kruskal Wallis analysis of variance (ANOVA). The level of significance was set at  $p \leq 0.05$ . Table 5.3 reviews the ANOVA, which reveals a significant difference between all three groups.

**Table 5.3:** Raw Score Means (and Standard Deviations) of each test for Two Clinical Groups and a Demographically Matched Typically Developing Group, (N=263)

|   | DLD-C group<br>(n=89) | DLD-E group<br>(n=83) | TD group<br>(n=91) | p-value* |
|---|-----------------------|-----------------------|--------------------|----------|
| Language Comprehension <sup>a,b,c</sup> | 69(4.2)               | 73(5.7)               | 98(3.2)            | <.001    |
| Restating Information <sup>a,b,c</sup>  | 47(5.6)               | 45(3.8)               | 57(2.6)            | <.001    |
| Following Directions <sup>a,b,c</sup>   | 48(4.7)               | 47(3.6)               | 56(2.4)            | <.001    |
| Morphology and Sentence Structure       | 48(3.8)               | 47(4.3)               | 64(2.7)            | <.001    |

Abbreviation: DLD-C, Developmental Language Disorder - Language Comprehension; DLD-E, Developmental Language Disorder - Expressive Language; and TD, Typically Developing

\*Kruskal-Wallis Analysis of Variance test

<sup>a</sup> significant difference between DLD-C and TD groups

<sup>b</sup> significant difference between DLD-E and TD groups

<sup>c</sup> significant difference between DLD-C and DLD-E groups

## Standards for fairness

Standards of fairness are crucial to the validity and comparability of the interpretation of test scores (AERA, APA, and NCME, 2014). The identification and removal of construct-irrelevant barriers maximizes each test-taker's performance, allowing for skills to be compared to the normative sample for a valid interpretation. Test constructs and individuals or subgroups of those who the test is intended for must be clearly defined. In doing so, the test will be free of construct-irrelevant barriers as much as possible for the individuals and/or subgroups the test is intended for. It is also important that simple and clear instructions are provided.

## Criterion Validity

In assessing criterion validity, a full correlation analysis was not possible for the Language VAT when compared to the current body of language tests. The Language Video Assessment Tool is unique in its content and design. Therefore, criterion validity should be analyzed with caution. The Language VAT cannot be expected to fully correlate to the existing body of language assessments because of its unique focus on functional language stimuli to resemble real-life academic presentations which is not available within other language tests.

To examine criterion validity, correlations of Language Comprehension, Restating Information, Morphology and Sentence Structure and Following Directions tests with two other measures of language were conducted. The Clinical Assessment of Spoken Language (CASL) is an individually-administered oral language assessment for students with ages 3 to 21 years. The test measures lexical, semantic, syntactic, and pragmatic language categories (Carrow-Woolfolk, 2017). The TILLS is a comprehensive, norm-referenced test that has been standardized for three purposes: To identify language/literacy disorders, to document patterns of relative strengths and weaknesses, and to track changes in language and literacy skills over time in students ages 6–18 years (Nelson et. al, 2016).

The Language Comprehension Test, the Meaning from Context subtest of the CASL test as well as the Language Comprehension subtest of the TILLS test were administered to 30 participants in counterbalanced order. Time between test administrations ranged from the same day to 5 days. The Restating Information Test, the Sentence Expression subtest of the CASL test and the Story Retelling subtest of the TILLS test were administered to 30 participants in a counterbalanced order. Time between test administrations ranged from the same day to 5 days. The Following Directions test and the Following Directions subtest of the TILLS test were administered to 30 participants in a counterbalanced order. Time between test administrations ranged from the same day to 5 days. The Morphology and Sentence Structure test and the Grammatical Morphemes subtest of the CASL test were administered to 30 participants in a counterbalanced order. Time between test administrations ranged from the same day to 5 days.

The concurrent validity was assessed using Pearson’s correlation among the Language VAT, CASL and TILLS tests. Correlation coefficients of  $\geq 0.7$  are recommended for same-construct instruments while moderate correlations of  $\geq 0.4$  to  $\leq 0.70$  are acceptable. The level of significance was set at  $p \leq 0.05$ . When assessing validity, the Language VAT tests were substantially correlated with the Story Retelling, Language Comprehension and Following Directions subtests of the TILLS test. The correlation between the Language VAT tests and the CASL subtests were 0.69 and 0.62 respectively,  $p < 0.001$ . While there is an apparent relationship between performance on some measures, the Language VAT evaluates language functioning from a conceptually different framework (please refer to Chapter 2).

**Table 5.4:** Pearson’s Correlations between the Language Video Assessment Tool Tests and Other Language Measures (n=30)

|                                | LC  | RI  | FD  | MSS |
|--------------------------------|-----|-----|-----|-----|
| CASL - Meaning from Context    | .69 |     |     |     |
| CASL - Sentence Expression     |     | .62 |     |     |
| CASL – Grammatical Morphemes   |     |     |     | .86 |
| TILLS - Story Retelling        |     | .88 |     |     |
| TILLS – Language Comprehension | .86 |     |     |     |
| TILLS – Following Directions   |     |     | .84 |     |

## Test-Retest Reliability

This is a factor determined by the variation between scores or different evaluative measurements of the same subject taking the same test during a given period of time. If the test is a strong instrument, this variation would be expected to be low (Osborne, 2008). The Language VAT was administered to 30 randomly selected examinees, ages 5-0 through 12-11 over two testing periods. The interval between the two periods ranged from 16 to 20 days. To reduce recall bias, the examiners did not inform the examinees at the time of the first administration that they would be tested again. All retesting was done by the very same examiners who administrated the test the first time. The results are listed in Table 5.5. The test-retest coefficients for the subtests were all greater than .80 and those for the composite exceeded .90. The size of these coefficients support test-retest reliability of the Language VAT.

**Table 5.5**

| <b>Test - Retest Reliability</b> |        |          |    |          |    |                         |
|----------------------------------|--------|----------|----|----------|----|-------------------------|
| Age Groups                       | Number | 1st Test |    | 2nd Test |    | Correlation Coefficient |
|                                  |        | Mean     | SD | Mean     | SD |                         |
| <b>1, 2, &amp; 3</b>             | 30     |          |    |          |    |                         |
| LC                               |        | 83       | 2  | 82       | 1  | 0.91                    |
| RI                               |        | 45       | 1  | 46       | 1  | 0.88                    |
| FD                               |        | 48       | 2  | 48       | 2  | 0.84                    |
| MSS                              |        | 56       | 1  | 57       | 1  | 0.89                    |
| <b>4, 5, &amp; 6</b>             | 30     |          |    |          |    |                         |
| LC                               |        | 94       | 2  | 11       | 1  | 0.90                    |
| RI                               |        | 52       | 1  | 53       | 1  | 0.86                    |
| FD                               |        | 53       | 3  | 53       | 2  | 0.89                    |
| MSS                              |        | 60       | 2  | 61       | 1  | 0.92                    |
| <b>7 &amp; 8</b>                 | 30     |          |    |          |    |                         |
| LC                               |        | 98       | 2  | 10       | 1  | 0.91                    |
| RI                               |        | 56       | 2  | 57       | 2  | 0.87                    |
| FD                               |        | 57       | 1  | 57       | 1  | 0.80                    |
| MSS                              |        | 64       | 2  | 65       | 1  | 0.93                    |

Abbreviations: LC, Language Comprehension; RI, Restating Information; FD, Following Directions; MSS, Morphology and Sentence Structure

## Inter-rater Reliability

Interrater reliability measures the extent to which consistency is demonstrated between different raters with regard to their scoring of examinees on the same instrument (Osborne, 2008). For the Language VAT, inter-rater reliability was evaluated by examining the consistency with which the examiners are able to follow the test scoring procedures. Data was examined by five California licensed speech-language pathologists who independently evaluated 24 test administrations that were selected in a random manner from the normative sample. The raters had one training session during which the item-by-item scoring rules, and the procedures of the study were presented before being asked to score the same verbatim

responses of the 24 randomly selected examinees. The results of the scorings were correlated. The coefficients were averaged using the z-transformation method.

| <b>Standard Errors of Measurement by Age Groups</b> |          |    |    |     |
|---|----------|----|----|-----|
|   | Subtests |    |    |     |
|   | 1        | 2  | 3  | 4   |
| <b>Age Group</b>                                    | LC       | RI | FD | MSS |
| <b>7-0 to 7-11</b>                                  | 1        | 2  | 1  | 2   |
| <b>8-0 to 8-11</b>                                  | 1        | 2  | 2  | 1   |
| <b>9-0 to 9-11</b>                                  | 2        | 2  | 1  | 2   |
| <b>10-0 to 10-11</b>                                | 1        | 2  | 1  | 1   |
| <b>11-0 to 11-11</b>                                | 1        | 2  | 1  | 1   |
| <b>12-0 to 13-11</b>                                | 1        | 2  | 1  | 1   |
| <b>14-0 to 15-11</b>                                | 1        | 2  | 1  | 1   |
| <b>16-0 to 18-11</b>                                | 1        | 1  | 1  | 1   |
| <b>Average</b>                                      | 1        | 1  | 1  | 1   |

Abbreviations: LC, Language Comprehension; RI, Restating Information; FD, Following Directions; MSS, Morphology and Sentence Structure

| <i>Test</i>                                       | <i>Reliability</i> |
|---|--------------------|
| <i>Restating Information (N=29)</i>               | <i>.81</i>         |
| <i>Following Directions (N=29)</i>                | <i>.79</i>         |
| <i>Morphology &amp; Sentence Structure (N=29)</i> | <i>.84</i>         |
| <i>Language Comprehension (N=29)</i>              | <i>.92</i>         |

## *Effectiveness of Remote Virtual Assessment*

Over the past few years, the need for valid and reliable remote assessments has become more evident. In March 2020, we saw many schools and clinics around the world close their doors and turn to virtual speech and language services due to the COVID-19 pandemic. Now, as we are moving our way out of the pandemic, we are continuing to see virtual speech and language services. The reason, possibly, is because virtual speech and language services work (Gabel, Grogan-Johnson, Alvares, Bechstein, & Taylor, 2013) and can be more convenient for some families and individuals.

When we consider the individuals who are receiving speech and language services, the majority are in a critical period of speech and language development (Nicholas & Geers, 2006), and thus, it is crucial that services continue on in order to avoid negative effects on academic performance, peer relationships, and

overall quality of life (Wales, Skinner, & Hayman, 2017; Taylor, Armfield, Dodrill, & Smith, 2014; Kaiser & Roberts, 2011). Previous research has suggested that tele-practice can be an effective model for assessment and treatment (Wales, Skinner, & Hayman, 2017; Keck & Doarn, 2014; Theodoros, 2008; Gabel, Grogan-Johnson, Alvares, Bechstein, & Taylor, 2013). Additionally, the American Speech-Language-Hearing Association (2020) has approved tele-practice as an appropriate method for the assessment and treatment of speech and language disorders. In order to feel confident in the accuracy, reliability, and validity of remote assessments, clinicians can evaluate how scores obtained during remote assessment compare to those scores obtained from in-person administration.

The present study compares speech sound performance results of in-person versus remote administrations of the *Language Video Assessment Tool* (VAT). In order to examine the equivalency between in-person and remote assessments, a test-retest design was used for this study. Each individual who participated in this study was tested twice with the *Language Video Assessment Tool* (VAT), once in-person and once remotely. The same clinician administered both the in-person and remote assessment for each participant. Additionally, the order of which assessment format (in person vs. remote) occurred was counterbalanced. The purpose of the present study is to determine if there are any significant differences in language performance results when testing in-person compared to testing remotely. The present study will also evaluate rater-reliability by evaluating if there are any differences in the clinician's ratings of performance when testing occurs in-person vs. remotely.

The *Lavi Institute* provides a technical manual for the administration and scoring of the *Language VAT*. It is a requirement that the clinician administering the test read and become familiar with the administration, recording, and scoring procedures before using this, or any, assessment tool.

## METHOD

### *Participants*

One hundred and six children, aged 5 years, 0 months, to 14 years, 0 months participated in this study. The sample consisted of forty-nine who were considered typically developing and fifty-seven with a previously diagnosed developmental language delay. Demographic characteristics are reviewed in Table 6. The study's sample was balanced for age, gender, and race or ethnic group.

Four examiners participated and administered the assessment used in this study. All examiners were state licensed, ASHA-certified speech-language pathologists (SLPs). The SLPs collected data from September 2020 to December 2022. The SLPs were recruited through *The Lavi Institute*, a research and professional development company. All examiners received compensation for their participation in the study. The one hundred and six participants were also recruited through *the Lavi Institute* and received compensation (e.g., gift card) for their participation.

### *Materials and Procedures*

Prior to all in-person and remote assessments, parent consent was provided to assess each child. Parents also provided consent to have their child's data included for the purpose of this study. Examiners confirmed with parents the day before the remote assessment took place that each child had access to an electronic device, such as a laptop or tablet, with headphones and a built-in microphone. Remote

administration was completed securely over the online Zoom platform. Individual meeting links with passwords were provided for each participant and additional licensing was provided for the examiner to secure HIPAA compliance.

The *Language VAT* is composed of short pre-recorded video segments. Therefore, clinicians used an electronic device during both in-person and remote administrations to access the video-based *Language Video Assessment Tool*.

During remote assessment, the examiner used the screen-sharing feature on Zoom to present and administer the *Language VAT*. After displaying a test item to the student, the examiner paused the test, stopped screen-share, and asked the test item questions per test instructions. The clinician would then listen carefully to the answers. Then, the examiner would start screen-share again and move on to the next item and continue the process until all of the *Language VAT* items were administered.

During each participant's first assessment, he/she was fully assessed using the *Language VAT*. Each participant was then scheduled for his/her follow-up assessment at least three weeks later. A student's speech sound production skills are not expected to change significantly during this time period. Thus, the test-retest method is beneficial in comparing the results of a student's in-person versus remote performance. Additionally, due to this research design, the present study counterbalanced the order of the test format. For example, half of the participants in the typically developing group and half of the participants in the clinical group received an in-person assessment the first time they were assessed and then received remote assessment the second time. The remaining participants received the remote administration the first time they were assessed and an in-person assessment on the second test date.

During both in-person and remote assessments, examiners recorded each participant's responses on the online digital protocol. The results of each assessment were then calculated on the test's website page. The *Language VAT* yields a raw score, standard score, and percentile rank. Participants' standard scores from both testing formats were compared to obtain test-retest reliability. Raw scores from both testing conditions were used to obtain rater-reliability.

## RESULTS

Test-retest reliability is the ability for a test to reveal the same score and/or diagnosis when given more than once over a short interval of time. This method was used to determine if the remote administration of the *Language VAT* would reveal the same score and/or diagnosis as the in-person administration. The *Language VAT* was administered twice to one hundred and six participants, aged 5 years, 0 months, to 14 years, 0 months, once in-person and once remotely. The interval between the two testing dates ranged from 20 to 25 days. Participants had the same examiner during the first and second administration. The results are displayed below in Table 1. All participants were grouped initially for primary analysis. The test-retest coefficients for the in-person and remote formats were greater than .80 indicating strong test-retest reliability.

Mean raw scores and standard deviations for in-person and remote standard scores of the *Language VAT* are provided in Table 7. The variance in means across groups is composed of the expected range of performance for typically developing participants (ranging from 5 years, 0 months, to 14 years, 0 months) with the expected range of performance for those with a developmental language delay (ranging from 5 years, 0 months, to 14 years, 0 months). To calculate the effect size, the difference between the mean standard scores of the two testing instances was divided by the pooled standard deviation. An effect size range from 0.02 to 0.16 was realized for the entire sample. An effect size of 0.2

is considered small, 0.5 is considered medium, and 0.8 is considered large (Cohen, 1992). As such, the observed effect sizes were considered small meaning there is insignificant change between the two test conditions (i.e., in-person and remote). Additionally, there were no statistically significant differences found between in-person and remote administrations for the Language VAT.

In order to investigate the reliability of the examiner's ratings, raw scores from in-person and remote testing were compared for each participant. To calculate rater reliability, the intraclass correlation coefficient was used, following the method outlined by Shrout and Fleiss (1979). The intraclass correlation coefficients were .97 for the Language VAT indicating a very high level of agreement across the test administration conditions (i.e., in-person and remote) for the same participant.

## DISCUSSION

The purpose of this study was to determine if administering the *Language VAT* remotely would result in the same findings as if it was administered in-person. One hundred and six children students participated in this study and each participant was assessed with the *Language VAT* remotely and in-person. There was an average three-week gap between each test session. Additionally, test order was counterbalanced so that some students received the remote administration first and some received the in-person administration first. Each student's remote and in-person assessment results were compared, and there were no significant differences found between the two formats of assessment. Additionally, remote and in-person assessment resulted in strong reliability of raw and standard scores.

The results of this study demonstrate that in addition to successful in-person administration, the *Language VAT* can also be successfully administered remotely via a secure online platform such as Zoom. Remote assessment does not appear to impact an individual's language comprehension and spoken language performance or the examiner's ability to adequately rate an individual's language comprehension and spoken language production. Additionally, the results of the present study provide evidence that assessment tools can be successfully adapted for remote use and continue to yield valid and reliable results.

In the future, studies can continue to investigate the use of in-person assessment tools adapted for remote administration. Additionally, larger sample sizes with more diverse clinical populations should be used to determine the equivalency of normative assessments via remote administration. In doing so, the findings of future studies can establish whether remote administration of assessments is appropriate. Future studies should also investigate the use of other virtual online platforms and examine if there are any extraneous factors that may impact remote vs. in-person assessment administration. By continuing to investigate the use of remote assessments, clinicians can feel more confident using remote assessments and also guide researchers and test developers in the future.

| <b>Table 6</b>                                |                           |                    |
|---|---------------------------|--------------------|
| <b>Demographics of the Equivalency Sample</b> |                           |                    |
| <b>Sample Size = 106</b>                      |                           |                    |
| <b>Demographic</b>                            | <i>N</i> Normative Sample | % Normative Sample |
| <b>Gender</b>                                 |                           |                    |
| Male  | 60                        | 57%                |
| Female  | 46                        | 43%                |
| <b>Total</b>                                  | 106                       | 100%               |
| <b>Race</b>                                   |                           |                    |
| White   | 41                        | 39%                |
| Black   | 19                        | 18%                |
| Asian   | 9                         | 8%                 |
| Hispanic                                      | 32                        | 30%                |
| Other   | 5                         | 5%                 |
| <b>Total</b>                                  | 106                       | 100%               |
| <b>Clinical Groups</b>                        |                           |                    |
|   | 57                        | 54%                |

**Table 7**  
**In-Person vs. Remote Administration Equivalency of Standard Scores, Correlations and Effect Sizes**

|  | <i>N</i> | In-Person |     | Remote |     | <i>r</i> | Effect Size |
|--|----------|-----------|-----|--------|-----|----------|-------------|
|  |          | Mean      | SD  | Mean   | SD  |          |             |
| Typically Developing                     |          |           |     |        |     |          |             |
| <i>Following Directions</i>              | 49       | 56        | 0.8 | 55     | 0.5 | .98      | 0.02        |
| <i>Restating Information</i>             |          | 55        | 3.4 | 53     | 3.1 | .91      | 0.04        |
| <i>Language Comprehension</i>            |          | 95        | 3.1 | 96     | 3.6 | .96      | 0.10        |
| <i>Morphology and Sentence Structure</i> |          | 64        | 1.2 | 64     | 0.9 | .93      | 0.07        |
| Language Impairment                      |          |           |     |        |     |          |             |
| <i>Following Directions</i>              | 57       | 39        | 2.1 | 38     | 3.0 | .98      | 0.03        |
| <i>Restating Information</i>             |          | 29        | 3.7 | 27     | 2.5 | .93      | 0.07        |
| <i>Language Comprehension</i>            |          | 54        | 3.5 | 53     | 3.1 | .97      | 0.09        |
| <i>Morphology and Sentence Structure</i> |          | 39        | 2.8 | 37     | 2.4 | .93      | 0.16        |

## Highlights of the Language Video Assessment Tool

The results of the *Language Video Assessment Tool* provide information on the spoken language comprehension and expressive language skills that children and adolescents require to succeed in school and social situations. This assessment is particularly valuable to individuals who have delays in spoken language comprehension, expressive language, language integration, literacy, and social interactions. Data obtained from the *Language VAT* is useful in determining eligibility criteria for a student with a developmental language disorder.

### *Strong Psychometric Properties*

The *Language Video Assessment Tool* was normed on a nationwide standardization sample of 1012 examinees. The sample was stratified to match the most recent U.S. Census data on gender, race/ethnicity, and region. Please refer to Chapter 4 for more information of the standardization process.

The *Language VAT* areas have strong sensitivity and specificity (above 80%), high internal consistency, and test-retest reliabilities. Criterion-related validity studies were conducted during standardization, with over 1012 participants. Please refer to Chapter 5 for more information on the summary results of the reliability and validity studies.

The contextual background and theoretical background sections described in Chapters 1 and 2 provide construct validity of the *Language VAT*. Additionally, please refer to chapter 1 for descriptions of each language skill observed and literature reviews to support this type of measurement included in the *Language VAT*.

### *Ease and Efficiency of Administration and Scoring*

The *Language Video Assessment Tool* consists of four tests: language comprehension, story retell, following directions, and morphology and syntax. The *Language VAT* score converting software is available on the *Video Assessment Tools* website. Please review Chapter 3 for more information on the easy and effective administration process.

The *Language VAT* utilizes visually appealing videos and pictures to keep students engaged and motivated during assessment. The protocols for the *Language VAT* can be scored easily online, and our test converting software works fast to provide you with standard scores and percentiles. Additionally, our report generator will save you time when it comes to completing the write-up portion of your evaluation.

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