SIG 12

Tutorial

The Protocol for the Analysis of Aided Language Samples in Spanish: A Tutorial

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ARTICLE INFO

ABSTRACT

Purpose: The purpose of this tutorial is to describe a tool and a procedure to support the collection and qualitative manual analysis of aided language samples in Spanish.
Method: The Protocol for the Analysis of Aided Language Samples in Spanish (PAALSS) was developed from the present knowledge of Spanish language acquisition, and established procedures for the analysis of aided language samples. A draft version of PAALSS was distributed among 476 augmentative and alternative communication (AAC) service providers in Argentina, Chile, Costa Rica, Mexico, and the United States, who provided feedback on their usability and applicability. The clinical application of PAALSS is illustrated through the analysis of three different language samples of an 8-year-old child who uses aided AAC.
Results: The use of PAALSS allowed the child's educational team to document the child's strengths and to set therapy goals to address her needs, such as increasing the length of her utterances and other structures essential for grammaticalization including articles, adjectives, adverbs, diminutives, morphemes for gender and number, prepositions, and personal pronouns.
Conclusions: PAALSS can be used to describe the expressive language use of children who use aided AAC in Spanish and are in the early stages of language development. PAALSS can also be used as a guide to set goals for and measure outcomes of language therapy along four domains of expressive language including vocabulary, morphology, grammatical complexity, and syntax.
Supplemental Material: https://doi.org/10.23641/asha.19233237

An understanding of the receptive and expressive language skills of individuals who use augmentative and alternative communication (AAC) is an essential component of evidence-based practice (EBP) and critical to set appropriate language goals and adopt the most effective intervention strategies (Hill, 2004). Yet, assessing the expressive language abilities of individuals who use AAC can be a difficult task. Standardized tests can tell whether an individual knows and does something under tightly controlled conditions and strict behavioral expectations, but will not describe how an individual communicates in different situations. In addition, standardized test performance can be influenced by a discrepancy between the abilities of the client and the access and response modalities required by the test. Assessing the expressive abilities and needs of individuals who use AAC and whose home language is not English can be further complicated (Soto & Yu, 2014). Often, standardized and formal tests do not provide a valid assessment of linguistic competence in bilingual clients who use AAC because test results may be biased by a discrepancy between the linguistic and cultural knowledge expected by the testing instrument versus those of the actual test taker, as well as by the lack of normative data from participants.

A detailed description of how an individual who uses AAC communicates is particularly important as people who use AAC have been found to use a wide range of communicative resources, as well as complex and creative strategies to compensate for the lack of appropriate

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vocabulary (e.g., Deliberato et al., 2018; Smith, 2015). These strategies have been extensively described in the literature (e.g., Soto, 1999) and include among others, the use of multiple modalities in a single utterance (e.g., an icon plus a gesture to change from a declarative to an interrogative utterance), word substitutions (e.g., *water* for *shower*), phonological similarity (e.g., *long + more* for *lawn mower*), and the use of word modification markers such as "the opposite of," "a combination of," "sounds like," and so forth to change the meaning of a specific vocabulary item. Given the multimodal and creative nature of aided communication, the clinical utility of standardized tests has been repeatedly questioned in favor of more informal and informative assessment methods such as language sampling and analysis (e.g., Kovacs & Hill, 2015, 2017; Mooney et al., 2021; Savaldi-Harussi & Soto, 2016).

Language Sampling Analysis in AAC

Language sampling and analysis (LSA) can be used to describe an individual's use of language in a variety of communicative contexts and to measure changes in language abilities over time. LSA has proven to be a valid tool to assess the expressive language skills of children with severe speech (e.g., Binger et al., 2016) and motor impairments (e.g., Hustad et al., 2014). It has also been used in numerous research studies detailing different aspects of language intervention in AAC (e.g., Soto & Clarke, 2017, 2018; Soto et al., 2009). LSA allows the clinician to describe an individual's successful communicative strategies and hidden competencies rather than highlight the deficits. Because LSA can be applied periodically and is evidence-based, it is advocated as a proven and reliable method to describe language growth in children with typical and atypical language development, including those who are bilingual, speak nonstandard dialects, and use speech-generating devices (SGDs).

Several approaches to the analysis of language samples of individuals who use SGDs have been described in the literature (see the work of Mooney et al., 2021 for a review). In a recent study, Mooney et al. (2021) used a combination of methods to analyze language samples produced by two individuals who used SGDs, including the Systematic Analysis of Language Transcripts (SALT; Miller & Iglesias, 2012), Computerized Language Analysis (CLAN; MacWhinney, 2000), and Realize Language (Cross & Segalman, 2016). SALT and CLAN are computer programs that were designed for naturally speaking children and require the professional to transcribe the observation according to program-specific written codes and conventions. Both computer programs can analyze many linguistic skills along the domains of lexical diversity, grammatical categories, syntax, and morphology, and they contain their own database of control data

extracted from children with typical development. Realize Language (Cross & Segalman, 2016) is a web-based tool that analyzes automated data logs. Automated data logging is a feature available in some SGDs and refers to the automated recording and saving of the utterances produced on the SGD during the time the feature is turned on. Realize Language was designed specifically to analyze language samples of users of AAC, and, as such, it includes both linguistic measures and other variables that are specific to the use of SGDs such as the number of activations, selection rate, word prediction features, and others. Mooney et al. (2021) found that all three methods of analysis provided robust information regarding the language profile of each participant.

While there is an increasing number of tools and resources available for LSA for users of AAC in English, there is limited availability of such resources for other languages such as Spanish (Soto & Yu, 2014; Tönsing & Soto, 2020). Given the increasing number of individuals who are using AAC in Spanish in the United States and other countries with large Spanish-speaking communities, it is imperative to develop tools and resources to assist AAC service providers serving those communities. While both SALT and CLAN are available in Spanish, their use requires access to their software, competence in English, and command over their specific transcription convention notations.

The purpose of this tutorial is twofold: (a) to describe a tool developed for the hand transcription and qualitative analysis of language samples generated by users of AAC in Spanish and (b) to illustrate how the tool can be used to describe an individual's expressive language profile and set goals for further intervention.

LSA for Users of AAC in Spanish

The lack of valid standardized language assessment tools for children who use AAC in Spanish underscores the need to use a variety of approaches including parental reports, behavioral observations, and LSA. In fact, LSA is considered the gold standard in assessing the linguistic skills of children from culturally and linguistically diverse backgrounds (see the work of Gutiérrez-Clellen et al., 2000; Voniati et al., 2021).

The Protocol for the Analysis of Aided Language Samples in Spanish (PAALSS; see Supplemental Material S1) was inspired by the Quick AAC Developmental Profile (Cross, 2010), and developed to provide professionals working with individuals who use aided AAC in Spanish with a systematic way to capture and describe their clients' expressive language skills. The protocol takes into account the characteristics of Spanish grammar and includes an inventory of language skills along four domains of language use: vocabulary, morphology, grammatical complexity, and syntax. The skills follow typical language development

milestones and are organized developmentally from the time an individual begins to use single word messages until s/he begins to generate compound sentences. The use of the protocol allows a professional not only to calibrate an individual's expressive language within that scope and sequence of skills but also to provide a developmental framework to set appropriate goals.

PAALSS differs from other tools in several ways. First, PAALSS can be used to describe expressive language skills in both children and adults who use AAC and are at the earlier stages of Spanish language acquisition, as most of the skills that are included have been observed in both children learning Spanish as their first language, and in children and adults learning it as a second language (e.g., Harrison, 1992). Second, PAALSS enables clinicians to describe several dimensions of language use simultaneously with one approach. By considering multiple domains of language simultaneously, clinicians have the opportunity to observe interrelated linguistic skills (e.g., lexicon and grammar) and set multiple related targets for intervention. Third, PAALSS does not require the use of specific software or knowledge of specific transcription notations. Instructions for its use are available in both English and Spanish.

The use of PAALSS is intended for individuals who use aided AAC and are at the earlier stages of Spanish language use. These individuals would fit the profile of *emergent-transitional* or *context-dependent communicators* by the Dynamic AAC Goals Grid-2 (DAGG-2; Clarke & Schneider, 2015), or are between *Level II* and *Level III* of linguistic competence according to the AAC Profile (Kovach, 2009) and beyond. Both the AAC profile and the DAGG-2 are tools that help clinicians assess an individual's current level of skills and develop goals along four domains (operational, linguistic, social, and strategic) and five levels of communicative competence. Like the DAGG-2 or the AAC profile, PAALSS does not yield a normed score nor is intended to do so. Its goal is to provide a general idea of the user's expressive language profile and the areas to be reinforced. Scores resulting from the different sections of the protocol can be used to record changes over time (e.g., increases in vocabulary, use of bound morphemes, and grammatical complexity), and set goals for intervention.

Collecting a Language Sample

Because the tasks and materials for language elicitation have been found to have an effect on the quality, length, and content of the language sample (e.g., Küntay, 2004; Küntay & Ervin-Tripp, 1997), it is recommended that the collection of language samples occurs across multiple sampling contexts involving a range of activities and partners familiar to the client. Elicitation tasks and materials should be tailored to the client's developmental level,

age, and interests (see the work of Voniati et al., 2021 for a description of and reliability of the different methods that have been employed to collect language samples). Elicitation tasks can include describing a personal photograph, graphic story reading and retelling, conversing about a preferred topic or a topic of personal relevance, completing a story where the clinician provides the beginning and asks the client to make up the rest, or reading a wordless picture book. For additional considerations for the use of language sampling with children and adolescents, see the works of Nippold et al. (2017) and Nippold (2020). To download materials for elicitation tasks with adults, see https://www.rit.edu/ntid/slpros/assessment/lanandcomp/materials.

Special consideration needs to be given to the fact that each elicitation task is expected to yield different structural properties in an individual's language (Nippold, 2020). For instance, sequential picture stories tend to generate more narrative structures than a single picture (e.g., Toronto, 1976). In addition, different types of prompting or questioning might lead to the preference of one form of discourse (e.g., labeling) over another (e.g., describing; Küntay, 2004). To get a full picture of a client's expressive language profile, we suggest to use between three and five distinct elicitation tasks traditionally used to generate a wide range of language structures and discourse types. Since these tasks will be used to describe the individual's use of language, communication partners should be encouraged to interact as they typically would. The style of facilitation of the partner and the level of prompting used in each observation should also be noted. The adult should avoid yes/no questions or questions that require a one-word response and instead use questions that are effective in eliciting complete sentences such as "What do you think is going to happen next? or "What is he saying here?" When looking at a picture story, the communication partner can make comments or relate the first part of a story pertaining to the picture and have the client tell what is happening next. It may be of interest to collect language samples with different communication partners to understand how context, familiarity, and the style of partner input is impacting the quality of language the client is producing.

Transcribing the Language Sample

It is recommended that all observations be videotaped to allow for later transcription and reliability checks with caregivers and other members of the professional team. Language samples can be transcribed using video transcription software, a word processor, or handwriting. The goal of transcription is to provide an accurate rendition of the recorded sample and represent in written form exactly what the child says and with as little modification by the transcriber as possible. Standard text can be used to capture multimodal features of expressive language specific to augmented interactions such as intelligible

vocalizations, gestures, facial expressions, manual signs, and device-generated utterances (see the work of Müller & Soto, 2002). Depending on the purpose of the analysis, the language sample can include the partner's contribution to the interaction. Though typically only the client's utterances are analyzed, the partner's comments can be used to evaluate the quality of the input and contribute to the description of the interaction.

Analyzing the Language Sample Using PAALSS

A minimum of 50 utterances per sample are typically recommended to reach a reliable measure of the child's expressive skills (e.g., Hadley, 1998). However, this may not be feasible when collecting samples of children who use AAC who tend to produce fewer utterances (Kovacs & Hill, 2015; Smith, 2006; Soto & Hartmann, 2006). Smaller language sample sizes can also yield language measures to track a child's progress during intervention when they are not used to compare a child against another child but to monitor a child's language growth over time (Voniati et al., 2021). The use of the PAALSS does not require a minimum set of utterances, sentences, or length to be used.

Utterance segmentation. Determining utterance boundaries can be problematic when analyzing languages samples of individuals who use aided AAC, as a message is often built across multiple turns and coconstructed with the communication partner (Mooney et al., 2021). Researchers in the field of aided communication have chosen to segment interactions using a wide range of units, including "conversational turn" (e.g., Farrier et al., 1985; Light et al., 1985a, 1985c), "communicative function" (e.g., Beukelman & Yorkston, 1982; Light et al., 1985b), "communication event" (e.g., Fishman et al., 1985), and "utterance" (e.g., Blau, 1986), although each of these units has its limitations.

During transcription, deciding what constitutes an utterance is crucial as utterance identification is a fundamental component for other analysis. Communication turns (CTs) are typically defined by their behavioral boundaries, such as a pause, a drop in the voice, or an interruption by the communication partner. A different strategy for utterance segmentation would be to use "sentence structure" to mark utterance boundaries. According to the structural definition, an utterance would be a word group that could be considered as a full clause or a sentence regardless of the number of turns that took to create (Owens, 2003). Let's look at the following example:

> Adult: What is happening here? (pointing at a picture)
> Client: Boy (pause)
> Adult: Umm, what about the boy?
> Client: Reads (pause)

Adult: What is the boy reading?
Client: Book

If we were to use CTs as the utterance boundaries, the total number of client utterances would be three, while if we were to use "sentence structure," the number of utterances would be one (boy reads book).

For the purpose of PAALSS, we suggest using either full clauses or CTs as the units of utterance segmentation, depending on the initial linguistic level of the client. CTs have been proven to be a useful unit of analysis for language samples in aided communication with clients who are at the beginning stages of expressive language use. CTs are bound semantically and behaviorally, and are flexible enough to include single or multiword utterances, a whole sentence even when this is ungrammatical, a single yes/no, a gesture, or a referencing eye gaze. The use of CTs allows for a range of communication functions and modalities to be quantified, respecting the multiple dimensions of communication that can be used by an individual who uses AAC (Müller & Soto, 2002). Using full clauses as segmentation boundaries is recommended when the clauses are grammatical, and when increasing the use of clauses and expanding clause structure are therapy goals.

Vocabulary. The PAALSS calls for counting every word in the language sample. The protocol includes a word list that can be used as a guide to track whether the language sample includes a specific vocabulary item, whether that item is available on the child's aided system but not observed in the sample, or whether the item is not yet available on the child's aided AAC system. The word list that is provided in PAALSS includes 219 nouns, verbs, adjectives, pronouns, adverbs, articles, prepositions, and conjunctions that are frequently used by Spanish-speaking children in the earlier stages of language development (Soto & Cooper, 2021). The list resulted from an analysis of the overlap between published and validated lists of words produced by young Spanish-speaking children (Manzano et al., 1997; Piñeiro & Manzano, 2000) and the MacArthur Inventarios del Desarrollo de Habilidades Comunicativas (Jackson-Maldonado et al., 1993). The list may not include all the words that the client used during the observation. Rather, the list can serve as a reference for words that are common in the early stages of Spanish development. It can also assist professionals to determine whether the language sample includes a representative proportion of word classes. Studies in Spanish language development suggest that starting at 16 months, the use of nouns stabilizes at around 55% of the overall sample, verbs increase to 22%, and close class words represent 13% (Jackson-Maldonado et al., 1993; Gallego & López-Ornat, 2005; Sellabona et al., 2009; Serrat et al., 2010). Periodic language sampling and analysis can assist professionals track the development of expressive vocabulary,

and the distribution of such vocabulary according to semantic categories and word classes.

The words in the list appear without inflections or derivations by gender and number. Therefore, if the sample includes the word "sale" (goes), the professional would mark the word as "salir" (to go), but also note the conjugation or derivation by gender and number that was observed. In scoring the vocabulary used in the sample, the clinician will note both the total number of words (i.e., tokens) and the total number of different words (i.e., types) per semantic category.

Morphology. The protocol allows for the analysis of the morphological structures observed within the sample. Morphological skills play a significant role in early Spanish language development, as Spanish is an inflectional language. Nouns and adjectives are inflected for gender, number, and aspect (e.g., diminutives). Verbs have a root with suffixes denoting person, tense, number, aspect, and mood (see the work of Gathercole et al., 1999, for a discussion on the acquisition of Spanish early morphology).

Users of the protocol will note the endings, derivations, and conjugations of the words or contractions that appear in the language sample, including gender, plural, diminutive/superlatives, copulas, imperative, past participle, perfect past, imperfect past, gerund, periphrastic future, future, and subjunctive. Evidence suggests that while there are differences in age of acquisition, the acquisition of Spanish verb morphology follows an order of acquisition whether the child is learning Spanish as his or her first or second language (Bedore, 2001; Harrison, 1992). In scoring the morphology used in the sample, the clinician will note both the total number of morphemes (i.e., tokens) and the total number of different morphemes (i.e., types) per category.

Grammatical complexity. The section to analyze the grammatical complexity of the language sample was adapted from the *Protocolo de Observación del Desarrollo Gramatical Temprano* (http://www.ucm.es/info/equial; cf. Mariscal-Altares et al., 2010). The protocol includes the grammatical structures observed in the early stages of Spanish language development presented in the order in which they are observed in children with typical development (e.g., López Ornat, 1990; Mariscal-Altares et al., 2010). These include simple noun clauses, simple verbal clauses, copulative sentences, negative sentences, interrogative sentences, and compound sentences. Simple noun clauses include clauses that combine (a) article and noun (e.g., la niña/the girl); (b) determinant and noun (e.g., esta niña/this girl); (c) article, noun, and adjective (e.g., la niña alta/the tall girl); and (d) determinant, noun, and adjective (e.g., esa niña alta/that tall girl). Verbal clauses include (e) verbal inflection indicating person (e.g., come/she eats), (f) past (e.g., comía/she ate), (g) periphrastic future (e.g., voy a jugar/ I am going to play), (h) clitics (e.g., dámelo/give it to me), (i) prepositions (e.g., debajo/

under), (j) possessives (e.g., mi perro/my dog), and (k) subjunctive (e.g., quiero que vengas/I want you to come). Compound and complex sentences include (l) coordination (e.g., voy y te ayudo/ I am coming and will help you) and (m) subordination (e.g., la niña que lleva sombrero/ the girl who wears a hat). For this section of PAALSS, each structure is scored once. Scoring reflects whether that type of structure was observed in each sample and whether the structure was produced grammatically or as a grammatical approximation. Use of PAALSS also allows the professional to check whether the grammatical structures featured in the protocol are available in the user's system and have not been targeted in intervention, or whether they are not available at all.

Syntax. Syntax is analyzed by noting whether there are sentences and the order of the words according to their function within the sentence (e.g., subject, verb, object). Each type of syntactic structure is scored according to whether the structure was observed in each sample as well as the specific exemplars of each structure. As in the previous sections, the word order possibilities available in the protocol follow what has been observed in children with typical language (Gutiérrez-Clellen et al., 2000; Jackson-Maldonado et al., 1993).

Case study and Clinical Implications

As stated above, the PAALSS can be used by clinicians to set goals and monitor the language progress of their clients who are learning AAC in Spanish. During the development phase, a draft version of PAALSS was distributed among 476 AAC service providers in the United States, Spain, Costa Rica, Chile, Argentina, and Mexico, during an online course on aided language sampling and analysis. The course was delivered in Spanish through an online platform (http://www.escuelaac.com) and has since been made available in YouTube (https://www.youtube.com/watch?v=ibK0t82wjjw). As part of the course, the professionals had to collect at least a language sample from one of their clients and send feedback on their usability and applicability. Changes to the format of the protocol, its wording, and scoring were conducted upon their recommendations.

The following section of this tutorial describes the analysis of three different language samples of the same child, Luna, a real child who uses aided AAC and participates regularly in structured language intervention to improve her expressive language skills. The team of interventionists that serves Luna belong to a large network of AAC specialists that helped organize the online course and have collaborated with the author in refining the format of the protocol (see http://www.lafabricadepalabras.com).

Participant

Luna is a monolingual 8-year-old girl with a diagnosis of severe quadriparesis due to cerebral palsy. As a result, she has very limited mobility and uses a wheelchair. Luna attends a general education second-grade classroom and is considered a beginner reader and writer by her teacher and support staff. According to them, Luna knows her alphabet, has strong phonemic awareness skills, and is able to decode and encode simple words.

She communicates using a combination of vocalizations, word approximations, and uses the Grid 3, an SGD that she accesses through eye pointing. The concepts in Luna's SGD are mainly represented graphically along with a written word. She is also learning to use an alphabet page to spell the beginning of words to which she does not have access to. According to the MacArthur: Inventario del Desarrollo Comunicativo (López Ornat et al., 2005), Luna has a receptive vocabulary of hundreds of nouns, 103 verbs, 57 adjectives, 23 prepositions, 12 pronouns, and six adverbs. When writing or engaging in academic activity, Luna will produce full simple sentences with support, but in spontaneous conversations, she typically produces one to two word utterances and relies on others to coconstruct the message with her. Luna receives AAC intervention through a private clinic at least 3 times a week. Luna has been using aided AAC in the family and in the private clinic since she was 5 years old. To this day, she uses her SGD mostly at home and at the clinic while relying mostly on unaided AAC to communicate at school, such as responding to yes/no questions, vocalizations, and facial expressions.

Language Sampling Contexts and Transcription

The first two language samples were collected within a week of each other, in order to establish a baseline of the expressive language skills of Luna, while the third one was collected 8 months later. All three language samples were collected at home by an AAC specialist who also was her communication partner in the elicitation tasks.

Sample one-hide and seek. For this task, Luna had hidden the piece of a puzzle and was giving instructions to the adult on where it was and how to find it. The adult used questions and comments to elicit instructions to find the puzzle piece.

Sample two-story generation. Luna was asked to create a story about a set of characters, locations, and objects that she was provided as manipulatives. The adult used open-ended questions and contingent comments to stimulate Luna's story generation.

Sample three-story retelling. For this task, Luna was expected to retell a story she had just read with her teacher. Like in previous tasks, the adult used open-ended questions and contingent comments to stimulate Luna's contributions to the task.

All three activities were videotaped using a digital video camera. The videos were transcribed using a standard word processor and an expanded standardized transcription notation system to include features of discourse specific to augmented interactions such as gestures, facial expressions, and vocalizations (Müller & Soto, 2002). For the purpose of this tutorial, we will focus exclusively on Luna's contributions to the interaction.

Results

Given Luna's initial level of expressive language use, her language samples were segmented using CTs, that is communication turns that were behaviorally bounded (see her samples in Supplemental Material S2). Below are Luna's contributions to each elicitation task and the corresponding findings.

Sample 1: hide and seek. Luna's response to the task consisted of 16 intelligible utterances, with a total of 25 tokens (total number of words), and 20 types (total number of different words). Among these were one personal pronoun (Yo), six different verbs (necesito, quiero, jugando, buscar, poner, and esconder), nine nouns (ayuda, camiseta, vaquero, calabaza, autobus, mano, uñas, culo, and pierna), two interjections (sí, no) and one preposition (debajo). In terms of morphology, she used the plural to modify a noun (uñas), the gerund (jugando), and first-person singular of present tense to modify a verb (necesito, quiero). The rest of the verbs she used were in infinitive with −ar, −er, and −ir endings. She also used a compound verb (Quiero ir jugando: I want to go playing) and a word substitution (ir for seguir). Luna's utterances consisted mostly of one or two words, but in the utterance when she used multiple word combinations, she followed a subject + verb word order (Yo quiero ir jugando).

Sample two-story generation. Luna's contributions to this task consisted of 22 intelligible utterances, with a total of 30 tokens (total number of words) and 23 types (total number of different words). Among these were one personal pronoun (Tu), 16 different verbs (leer, quieres, hacer, jugar, estar, contar, tocar, llamar, buscar, trabajar, beber, querer, comer, doler, volar, and encender), five nouns (sol, amigos, elefante, león, and cacho), and three adverbs (mucho, todo, nada). In terms of morphology, she used the plural to modify a noun (amigos) and second-person singular of present tense to modify a verb (quieres). She also used a compound verb (Quieres leer: You want to read). The rest of the verbs were used in infinitive form, like in the previous language sample. Luna's utterances consisted mostly of one or two words, but in the two utterances when she used multiple word combinations, she followed a subject + verb word order.

Based on the findings from these two language samples, Luna's educational team set a number of language objectives for her therapy including increasing her use and comprehension of articles, adjectives, adverbs, diminutives, morphemes for gender and number, prepositions, and personal pronouns in first and second singular and plural forms. They also wrote goals to increase the length of her utterances by combining at least three grammatical structures in a sentence such as noun + adjective + verb and subject+ verb + object, and to work on noun clauses that would include article + noun. While these targets may not follow a strict developmental order and jump ahead other previous skills, Luna's team made the selection based on the functionality of the target and their potential impact on the acquisition of other linguistic targets (e.g., the use of verbs impacts length utterance and the acquisition of different word classes; Hadley et al., 2016).

Sample three-story comprehension. The third sample was collected 8 months after the initial two. This sample consisted of 24 utterances, of which 13 were multiword combinations. The sample included 45 tokens and 36 types. Among these were seven pronouns (yo, tu, me, nosotras, lo, se, and que), 17 verbs (soy, sé, querer, jugar, ver, tener, acabó, pintar, ver, estamos, pintamos, gusta, estar, gustar, tocar, hacer, lees, and leer), three nouns (vaca, cabra, and cerdo), one adverb (más), one article (la), and one determinant (eso). In terms of morphology, she used gender to modify an article (la) and a noun (cabra), and gender and number to modify a pronoun (nosotras). In terms of inflectional morphology, she used the first- (soy, gusta) and second-person (quieres) singular present tense, first-person plural present tense (estamos, pintamos), and third-person singular past tense (se acabó). She also used a clitic (no me gusta). Her syntax included subject + verb (lees), subject + verb + adverb (nosotras pintamos más) and subject + verb + object (no lo se, no me gusta) structure.

Discussion

LSA has long been considered the gold standard for understanding and describing a client's expressive language skills, especially those who are from culturally and linguistically diverse backgrounds (Gutiérrez-Clellen et al., 2000). The purpose of the present tutorial is to describe a tool that can be used to analyze aided language samples by children who use aided AAC in Spanish and are at the earlier stages of language development. PAALSS was developed in light of the increasing interest in using LSA to describe the expressive language skills of clients who use aided AAC (e.g., Kovacs & Hill, 2017; Mooney et al., 2021) and the expansion of the use of AAC in Spanish in the United States and other countries with large Spanish

speaking communities. Some AAC manufacturers have created LSA software that assists clinicians with the analysis of language samples that are logged automatically. Unfortunately, automated analysis of language samples is not yet available in Spanish. In addition, some researchers in AAC have questioned the reliability of automated segmentation of logged data and call for clinicians to supplement this analysis with manual segmentation and analysis (see the work of Kovacs & Hill, 2017).

The use of the protocol provided Luna's team with a qualitative, yet systematic, evidence-based and broad description of her expressive language skills in relation to typical developmental milestones (Mooney et al., 2021; Savaldi-Harussi & Soto, 2018). They were able to document her specific strengths and areas of need in "oral" expression and used this information to set goals and plan meaningful and relevant intervention activities that directly addressed those needs. The recurrent use of PAALSS allowed the team to monitor and document her improvement in specific areas of expressive language. They were able to see that Luna's language is increasing in overall grammatical complexity, with notable changes in lexical diversity, use of pronouns, and inflectional morphology. The length of her utterances is also increasing, and her multiword combinations are beginning to incorporate different word classes. Based on the findings from the third sample, the team is working on increasing Luna's use of adjectives to modify nouns, adverbs to modify verbs, prepositions to indicate location and quantity, interrogative sentences, different word classes, morphological markers, verb conjugations, periphrastic future, and clitics. The biggest change in Luna's team is that they have incorporated regular and frequent LSA to adjust their language goals and monitor her language growth.

Clinical Implications

PAALSS is a tool available to clinicians who work with individuals who use aided AAC in Spanish, for whom norm-referenced, standardized language tests can be challenging. Clinicians can use PAALSS to describe how their client communicates in everyday situations and with different communication partners. PAALSS includes a sequenced inventory of language skills along the domains of vocabulary, morphology, grammatical complexity, and syntax that can be used to set developmentally appropriate and individualized goals for intervention. Unlike a norm-referenced tests, LSA with PAALSS can be used repeatedly without having a test–retest effect and can therefore be used to monitor a client's progress during language intervention. PAALSS can also help clinicians to obtain information on the client's specific strengths and weaknesses in specific language domains, which can be used to formulate expressive language goals, make clinical

recommendations, and advocate for the need for services. PAALSS does not require the use or learning of transcription conventions nor computerized tools, which can take considerable time to learn and can prevent clinicians from using LSA (Voniati et al., 2021).

The results of using the PAALSS are *not* intended to help identify language disorders nor make diagnostic decisions in children who use aided AAC in Spanish. Rather, LSA can provide robust and descriptive information regarding language use of a client that can be used to set goals and measure outcomes of treatment over time (Mooney et al., 2021). The protocol is meant to provide a systematic and evidence-based general direction (a scope and sequence of skills) to assist clinicians in analyzing samples and selecting targets for language intervention for children who use aided AAC in Spanish and for whom there are limited resources available. One might wonder if the skills presented in the protocol have to be selected in strict order. For instance, should a clinician target "gender" necessarily before "plural" or "verb tense"? The answer is no. Although Spanish-speaking children go through a basic sequence of development, there is always individual variation in the acquisition of inflectional patterns (e.g., Gathercole et al., 2002). Linguistic target selection has to occur on a case-by-case bases and take multiple factors into consideration, such as functionality and the potential impact that a target can have on the acquisition of other linguistic targets (e.g., verbs, relational concepts; Beukelman & Light, 2020).

Limitations and Future Research Needs

PAALSS represents the first attempt at creating a protocol for the analysis of aided language samples in Spanish and track linguistic changes over time. It addresses the urgent need to develop tools and resources for the Spanish-speaking community in the United States, as well as in the many countries where Spanish is the dominant language. As with any assessment tool, there are a number of limitations that need to be taken into account. First, the protocol focuses exclusively on structural aspects of language use such as vocabulary, morphosyntax, and grammar, and does not assess other critical areas of language or communicative competence in AAC such as receptive language or sociopragmatic, operational, and strategic aspects of AAC-mediated interaction. Clinicians are encouraged to supplement the use of PAALSS with other tools appropriate to describe their clients' communication profile along other domains of language and communicative competence (see the work of Mindel & John, 2022).

Another limitation is that, in its current version, the protocol does not provide guidance or rules to analyze language samples containing a combination of words from two or more languages in a single sample, a typical occurrence in bilingual children (i.e., code switching). Research on the use of PAALSS with bilingual children who use AAC is currently being conducted to reflect and account for this phenomenon. Additionally, although the instructions on the use of the protocol are available in English, its use requires some proficiency in Spanish. To overcome this limitation, a monolingual clinician can partner with a bilingual colleague or a family member to ensure a proper identification and analysis of the client's utterances.

Acknowledgments

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