Navajo
A Dynamic Assessment Clinical Tutorial

Davis E. Henderson

Standardized norm-referenced language assessments are used to identify developmental language disorder (DLD) in bicultural Navajo children. However, these assessments do not include normative data for Navajo children, the majority of whom are exposed to both Navajo and English, and consequently the assessments may not reflect their true language abilities. The purpose of this clinical tutorial is to provide background and alternative assessment information to help practitioners accurately identify Navajo children with and without DLD. In particular, the use of dynamic assessment, a test–teach–retest method, has shown promising results in differentiating Navajo children with and without DLD. **Key words:** *developmental language disorder*, *dynamic assessment*, *Navajo*, *tutorial*

BECAUSE OF inadequate language assessment practices (De Valenzuela et al., 2006; Faircloth & Tippeconnic, 2000; National Center for Educational Statistics, 2016), American Indian/Alaskan Native (AI/AN) children, including Navajo children, are overrepresented in special education programs, particularly in those delivered by speech–language pathologists (SLPs). According to the National Center for Educational Statistics (2016), during the 2013–2014 school year, 17% of the students served

Author Affiliation: *Department of Communication Sciences and Disorders, Northern Arizona University, Flagstaff.*

Corresponding Author: *Davis E. Henderson, PhD, CCC-SLP, Department of Communication Sciences and Disorders, Northern Arizona University, 208 E Pine Knoll Dr, Flagstaff, AZ 85011 (davis.henderson@nau.edu).*

under the Individuals with Disabilities Education Act (IDEA) were AI/AN, which is disproportionately higher than that observed in their African American (15%), European American, (13%), and Hispanic (12%) peers. This overrepresentation has been consistently documented for the last 14 years (Arizona Department of Education, 2018) and is likely due to the use of standardized norm-referenced language assessments that are linguistically and culturally biased (Henderson et al., 2018). Thus, there is a critical need for reliable and valid assessment procedures that can accurately classify AI children, including Navajo children, with developmental language disorders (DLD). Dynamic assessment (DA) provides one potential means for reducing disproportional representation of AI/AN children in special education.

The Navajo Nation is the largest AI reservation in the United States, extending into New Mexico, Arizona, and Utah (Department of Information Technology, 2011). Many Navajo children are bilingual, but some may be English-only speakers, whereas others may be Navajo-only speakers. Given this linguistic diversity, SLPs who are unfamiliar with the Navajo language and culture may have difficulty accurately identifying Navajo children with DLD. Furthermore, SLPs on the Navajo

reservation often are left to use standardized assessments that are normed on mainstream English-speaking children (Henderson et al., 2018).

In general, AI children experience disproportional failure in mainstream structured schools (Cummins, 1992). The origins of such educational struggles are likely due to many different factors, including those at the individual, familial, historical, economic, and cultural levels (Morris et al., 2006). Henderson et al. (2018) and Vining et al. (2017), specifically, indicated that Navajo children may perform poorly on typically employed standardized assessments because these assessments are linguistically and culturally biased. Sadly, despite the growing awareness of the importance of research on AI children, there has been limited research focusing on the development of more reliable and valid language assessment tools to better understand and take into account their unique linguistic and cultural differences.

FACTORS ASSOCIATED WITH OVERREPRESENTATION

Navajo culture

Culture refers to the values, norms, and traditions that impact how individuals of a particular group perceive, think, interact, behave, and make judgments about their world (Chamberlain & Medeiros-Landurand, 1991). Cultural characteristics also are known to affect language development across all domains (Demmert, 2005). Despite assimilation efforts and broken treaties by the U.S. Government, the Navajo people have maintained their Navajo language, clan system, and cultural beliefs (Frankland et al., 2004). Given their culture, norm-referenced assessments do not adequately capture the language development or culturally referenced normative expectations of Navajo children, and alternative assessments may be more beneficial.

For example, Navajos are quiet and reserved in unfamiliar environments (Henderson & Restrepo, 2016). A Navajo child may have an item from a norm-referenced assessment scored as incorrect if they do not respond in a few seconds. In contrast, alternative assessments may provide extra time for the child to answer, which in turn can help the practitioner build rapport and recognize culturally influenced behaviors. Furthermore, Navajo children are encouraged to listen and learn through observation when being taught a new skill in the Navajo home (Henderson & Restrepo, 2016). Alternative assessments acknowledge and even integrate cultural behaviors from an experienced adult or a more knowledgeable peer that may assist the child.

Navajo language

Approximately 169,500 individuals speak Navajo in the United States (Norris et al., 2012), and this number may increase. Schools on the Navajo reservation are implementing revitalization efforts for students to maintain or learn to speak Navajo (Todacheeny, 2014), and more teaching is being done in their native language. The Navajo language reflects the unique cultural experiences and traditions of the population, and the language is complex in phonology, morphology, syntax, grammar, and vocabulary (King & Goodman, 1990). The language has several dialects and lexical differences across various regions of the Navajo Nation. The wide range of the Navajo languages and dialects mirrors the Navajo people's diversity (Young & Morgan, 1987).

Alternative assessments take into account the Navajo language structure and characteristics by observing and comparing language evaluation results with other speakers of the language. The Navajo language contains words and concepts that cannot translate into English and vice versa. For example, "béésh nat'á'í bikáá' ná'oobałí" (the metal that flies on top that rotates) is the Navajo description of the English word *helicopter*. In addition, the Navajo language does not recognize specific pronouns such *he* and *she* but rather only the use of a general term *bí-* (Young & Morgan, 1987). In this case, an alternative

assessment may provide an opportunity for the Navajo child to not only fully demonstrate their current language skills but also learn new skills or vocabulary, whereas standardized assessments typically do not provide such learning opportunities.

Navajo-influenced English

Many Navajo students speak dialects of English that are nonstandard, differing from the Standard American English in grammar, vocabulary, pragmatics, and pronunciation. These differences stem from the Navajo language's influence (which can be their native or second language) on English (Henderson & Restrepo, 2016; Henderson et al., 2018). Because parents and grandparents in many Navajo communities primarily speak Navajo, their children are likely to speak a variation of English influenced by their Navajo grammar, phonological system, and language use patterns (Henderson et al., 2018). Navajo children may not be fluent in their Navajo language due to limited exposure, but they are nevertheless exposed to the Navajo language from various communicators (e.g., parents, grandparents, and other fluent Navajo speakers in the community; Henderson & Restrepo, 2016). Thus, Standard American English is difficult for a large percentage of Navajo children, even if English is their first language. For example, 31% of Navajo individuals speak English, yet they still have difficulty performing like their non-Navajo peers on academic skills evaluations and norm-referenced language measures that rely on understanding and using standard English due to their Navajo-influenced English language use (Leap, 1993).

According to Young and Morgan (1987), Navajo-influenced English can be heard and observed on the Navajo reservation across age groups. For example, subject–object–verb is the typical sentence structure of the Navajo language whereas English is structured as subject–verb–object. Alternative assessments may recognize the influence of subject–object–verb patterns in Navajo children's English and then provide an op-portunity for them to learn the appropriate syntactic structure of English.

DEVELOPMENTAL LANGUAGE DELAY VERSUS LANGUAGE DIFFERENCE

When working with Navajo children, it is important that SLPs understand and can distinguish between DLD and language differences. Specifically, it is important that SLPs do not misdiagnose a language difference as a DLD. The American Speech–Language–Hearing Association ([ASHA], 1993) defines DLD as difficulty with the "comprehension and/or use of a spoken, written, and/or other symbol system. The disorder may involve (1) the form of language (phonology, morphology, and syntax), (2) the content of language (semantics), and/or (3) the function of language in communication (pragmatics), in any combination" (p. 40). A language difference reflects a rule-governed language style that deviates in some way from the standard usage of the mainstream culture (Paul et al., 2018). For SLPs to distinguish between the two, ASHA (n.d.) requires SLPs to become culturally competent in better serving individuals from culturally and linguistically diverse backgrounds. This in turn requires that SLPs use culturally and linguistically appropriate assessments for Navajo and AI children to prevent their overrepresentation in speech and language therapy (Henderson & Restrepo, 2017; Henderson et al., 2018).

EDUCATION OF NAVAJO STUDENTS

The quality of education received by AI children has been thoroughly discussed and reported in a number of scathing reports (U.S. Department of Education, 1991). The educational curriculum designed for mainstream students disadvantages AIs. American Indians are likely to have the highest dropout rate of any ethnic group in the United States (U.S. Department of Education, National Center for Education Statistics, 2020), and they have the lowest academic achievement levels as

measured by mainstream standardized assessments (National Research Council, 1994).

The U.S. government sent Navajo children to boarding schools (Civilization Fund Act of 1819, P.L. No. 15-85, 1819) where they were forced to speak only the English language and were punished for speaking their native language. However, within the last three decades, tribal governments promoted the teaching of AI languages in the schools, a decision the U.S. government now supports (Native American Languages Act of 1990, P.L. No. 101-447, 1990). With this support, schools and SLPs have been encouraged to develop normative language assessments for Navajo children or to use alternative assessments to determine the presence of DLD.

LIMITATIONS OF NORM-REFERENCED STANDARDIZED ASSESSMENT TOOLS

Accuracy in classification

Specificity and sensitivity are metrics used to determine the accuracy of a measure in classifying populations. Plante (1998) stressed the significance of choosing an assessment that will accurately identify students as having DLD. An assessment should give empirical confirmation of adequate sensitivity—the ability of an assessment to accurately classify individuals who have an impairment, and specificity—the ability of an assessment to accurately classify individuals as not having an impairment (Lalkhen & McClusky, 2008). Speech–language pathologists are responsible for evaluating available assessments for properties of fairness and precision and for choosing assessments that meet the necessary criteria for the specific population (Paul et al., 2018). For example, the *Clinical Evaluation of Language Fundamentals (CELF)—Fifth Edition* (Wiig et al., 2013) manual indicates that it has a sensitivity of 100% and a specificity of 82% at a specified standard score cutoff of 85. However, whether the assessment cutoff score would be appropriate for Navajos who speak English has been challenged by Henderson and

Restrepo (2016) using the fourth edition of the same test (*CELF-4*; Semel et al., 2003), which is discussed later.

Linguistic bias

The American Speech–Language Hearing Association (2017) requires SLPs to be linguistically and culturally competent to serve individuals who come from diverse backgrounds. Speech–language pathologists on the Navajo reservation assess language skills using many available standardized assessments, including the *CELF*. However, these assessments include items that are culturally and linguistically biased, and that will, therefore, negatively affect a Navajo child's performance (Henderson et al., 2018). For example, a *CELF* question asked, "The girl has a hamburger to eat. Tell me, who has a hamburger?" and the correct response is "She does." However, the most common response by Navajo children was "the girl does." Participants gave precise genders rather than specific pronouns (Henderson & Restrepo, 2016), as pronouns in the Navajo language use a general term (*bí-* in Navajo simply translates to *she, he, it, they*; Young & Morgan, 1987). Furthermore, none of the assessments provide normative data that are adequate or appropriate for the Navajo population. The use of normative data on the Navajo population could decrease their overrepresentation in special education (Henderson et al., 2018). Even for Navajo children who are monolingual and monocultural English speakers, assessments may contain biases related to the instruments' linguistic task characteristics and the normative data provided for interpretation.

Cultural bias

A Navajo elder or parent teaching a Navajo child a new skill differs from nonnative teaching with respect to the quantity of time spent teaching the skill and the nature of the interaction with the elder, parent, or other adult (Henderson & Restrepo, 2016). For example, a young child learning to weave a rug is instructed by an experienced Navajo adult over time and is told

stories about the rug designs, tools, and other items used to weave. Over several interactions, the Navajo child observes and listens while learning about weaving a rug. Later, the child demonstrates their independent work in consultation with an elder or adult. Similar to alternative assessments, and unlike standardized norm-referenced assessments, the Navajo adult assesses the child's weaving knowledge after this careful instruction about weaving. Because Navajo children often are familiar with these kinds of extended and supportive interactions when learning new skills or acquiring new knowledge, typical mainstream assessments that do not permit such engagement with tasks will likely underestimate the child's ability to learn.

Inadequate normative samples for norm-referenced tools

Standardized norm-referenced assessments allow examiners to compare an individual student's scores with the scores of a representative normative group to determine where that student stands when compared with the general population (Salvia & Ysseldyke, 2004). Norm-referenced assessments are standardized and should be administered, scored, and interpreted in a specific manner to be considered valid. For an assessment to be considered valid, the norming group should be representative of the larger population and include a variety of the general population's characteristics, such as race, gender, socioeconomic status, geographic location, and disability (Chamberlain, 2005). Many norm-referenced tools report that AI children have been included in the norming group. However, AI languages are not homogeneous, and most likely Navajo children are not included in the norming sample of standardized assessments.

Limitations of *CELF-4*

The *CELF-4* (Semel et al., 2003) is a standardized norm-referenced assessment designed for English-speaking children in the United States and is frequently used with Navajo children for diagnostic purposes.

Speech–language pathologists compare the performance of Navajo children with the norms of children of the same chronological age. However, if a student performs poorly, norm-referenced assessments do not inform SLPs whether that student's performance is due to disability or cultural and linguistic differences attributable to Navajo language and culture (Crowley, 2010).

Henderson and Restrepo (2016) investigated how Navajo children with and without DLD performed on the *CELF-4*. A total of 31 tribally enrolled Navajo children participated in the study, which used a four-measure battery to identify participants with DLD ($n = 10$) versus without DLD ($n = 21$). The four measures included a parent questionnaire, a teacher questionnaire, mean length of utterance (MLU; via story retell), and individual education plans. Navajo children were exposed to both English and Navajo in the home and in the classroom, where 92% indicated that they code switched between Navajo and English, and 100% indicated that Navajo was spoken to them in the home and the school more than 80% of the day by their parents, grandparents, other relatives, and education staff (Henderson & Restrepo, 2016).

Overall, the *CELF-4* classified 18 of the 21 Navajo children without DLD based on the four measures as having DLD and the other three without DLD scored just at or above the cutoff standard score (85, 86, and 88; Henderson & Restrepo, 2016), suggesting substantial bias. Navajo children with DLD based on the four measures performed 2 standard deviations below the mean on the *CELF-4*, indicating that the *CELF-4*'s classification accuracy was 100%. However, all these Navajo children with DLD scored significantly below the mean, which also may suggest further linguistic and cultural bias. On the *CELF-4*, both groups of Navajo children had difficulty with plurals, pronouns, and comparatives due to language differences between Navajo and English. For example, plural markers in the Navajo language are found on the verb rather than the noun, as in English (Young & Morgan, 1987). In Henderson and

Restrepo's (2016) study, Navajo children with and without DLD had difficulty applying the rules of plural formation, and only 10% (3 of 31) used plurals appropriately.

Current assessment tools are considered inappropriate for Navajo children due to assessments being entirely normed with nonindigenous, mainstream English-speaking children (Henderson & Restrepo, 2017). Norm-referenced assessments are attractive to SLPs because they can make comparisons of language abilities to determine whether a child is significantly behind the general population; however, current standardized norm-referenced language assessments are often poor indicators of Navajo children's true language abilities because they do not match their culture, language and learning patterns, and strengths (Henderson et al., 2018).

ALTERNATIVE ASSESSMENTS

Because of the paucity of research regarding Navajo children, alternative assessments are appropriate to address the insufficiencies of standardized norm-referenced assessments (Henderson & Restrepo, 2016; Henderson et al., 2018). When evaluating diverse students, alternative approaches such as language sampling analysis, ethnographic interviewing, and DA are reported to result in valid assessments; therefore, they may be the appropriate procedures for Navajo children. However, these methods tend to have limited or no normative data and/or validation with the specific populations they might be employed. Regardless, DA is promising for accurately classifying Navajo children with and without DLD when implemented as described later.

DYNAMIC ASSESSMENT

Dynamic assessment "refers to an assessment of thinking, perception, learning, and problem solving by an active process aimed at modifying cognitive functioning" (Tzuriel, 2000, p. 386). Feuerstein's (1977, 1979, 1981; Feuerstein & Rand, 1974) theory of mediated learning experiences (MLE) and cognitive modifiability and Vygotsky's (1978) learning theory devised the conception of DA, which uses a test–teach–retest structure. Mediation is "structuring the social environment to reveal and improve learning behaviors" (Ukrainetz et al., 2000, p.143). Cognitive modifiability is yielding permanent progress in cognitive performance (Feuerstein, 1980). Dynamic assessment has been used often with culturally and linguistically diverse populations (Gutierrez-Clellen & Peña, 2001; Henderson et al., 2018; Lidz & Peña, 1996; Ukrainetz et al., 2000).

DA: LEARNING POTENTIAL

Dynamic assessment focuses on the child's learning potential rather than their performance and offers learning support for the child (Castilla-Earls et al., 2020). Because a child's potential to learn can be determined through interactions with more skilled individuals (Vygotsky, 1978), norm-referenced assessments that do not capitalize on such interactions may not capture true language ability. Assessing a Navajo child's learning potential through DA may be a viable option to determining an appropriate diagnosis and prescribing applicable intervention approaches. Dynamic assessment is culturally and linguistically appropriate for Navajo children as it is an interactive assessment to probe the child's learning potential by combining both testing and teaching (Vining et al., 2017).

The zone of proximal development (Vygotsky, 1978) presupposes an interaction between a more experienced individual and a less experienced individual on a task, where the less experienced individual progresses more independently at what was initially a jointly accomplished task. Furthermore, Vygotsky (1986) recognized developmental mechanisms through which natural psychological processes, such as memory, perception, concept formation, and attention, are improved through contexts in which parents, teachers, or more experienced peers

try to teach children something new. These interactions are culturally facilitated and slowly become adopted as advanced internal cognitive functions (Gutierrez-Clellen & Peña, 2001). The overall foundation of DA is built upon the learner performing a task better after instruction than before instruction as a result of a growth in learning a skill or acquiring new understanding.

Mediated learning experiences (Feuerstein, 1979; 1990) allow the mediator to facilitate learning during a teaching phase. The purpose of the mediator is to help the learner interact more efficiently and productively with new skills or while acquiring new knowledge (Kozulin & Presseisen, 1995). Dynamic assessment is grounded in the learner's independent success level and the carryover of learning past the learner's initial MLE level. One important component of DA is that the learner's progress is not compared with his or her same-age peers but instead is measured as change in cognitive strategies and task performance (Kozulin, 2002).

Modifiability refers to an individual's ability to adapt cognitive strategies to changing demands throughout the mediations (Feuerstein, 1977, 1979, 1981). Specifically, individuals are believed capable of changing their way of learning through supportive engagement and interaction with a more skilled individual. Mediation allows the individual's performance to improve prior to posttesting (Feuerstein, 1970, 1980) by using explicit and intentional instruction, while gradually reducing the level of support provided. The goal is for the individual to generalize the skills, knowledge, and/or strategies acquired and become independent in demonstrating their new ability.

DA WITH AMERICAN INDIAN CHILDREN

Ukrainetz et al. (2000) examined language-learning ability among Arapahoe/Shoshone kindergartners using DA. In total, 23 kindergartners participated in their study. Using teacher report and classroom observation, 15 were classified as stronger language learners

and eight as weaker language learners. Using DA, principles of categorization were taught to both learning groups where answers were scored on the basis of degree of modifiability and posttest categorization performance. Modifiability was measured on the basis of the combination of two checklists—Learning Strategies Checklist (Peña, 1993) and the Response to Mediation Checklist (Lidz, 1991). The Learning Strategies Checklist measured attention, planning, self-regulation, application, and motivation with a 3-point Likert scale, and the Response to Mediation Checklist measured the responsiveness of the child (4-point Likert scale), the effort that was required by the child (4-point Likert scale), and the transfer of learning from the child (3-point Likert scale). The researchers implemented two phases of mediation. Mediation Phase 1 used 7–8 pictures of items in four semantic categories (food, clothes, transportation, and animals) with a focus on identifying food. Mediation Phase 2 also used 7–8 pictures of the items in the four categories with a focus on identifying items in the transportation category. Results indicated that modifiability and posttest scores increased more for stronger learners than for weaker learners. Furthermore, the best discriminator between the two sets of learners was degree of modifiability.

In another study, Kramer et al. (2009) examined the usefulness of DA with narratives. Seventeen third graders, identified as members of the First Nations of Canada, participated in a DA and intervention (Miller et al., 2001) that assessed their oral narrative skills using two wordless picture books. The third graders were categorized as being normal language learners or with possible language-learning difficulties. Each learning group made gains from mediation; however, the normal language learner group benefited more from mediation than the possible language-learning difficulties group. Mediation was measured using two scales, both using a numerical value between 1 and 5. One scale measured the amount of effort required to teach the child and the other

measured the child's responsiveness to the teaching.

Henderson et al. (2018) examined the classification accuracy of 4- and 5-year-old Navajo preschoolers with and without DLD using a narrative measure that employs DA, the Predictive Early Assessment of Reading and Language (PEARL; Petersen & Spencer, 2014). The PEARL uses language comprehension and production to measure modifiability. The study examined how Navajo children with and without DLD performed on the PEARL.

For the pretest, using the PEARL, participants were told a story by an examiner and asked to retell the story. Although the participants retold the story, the examiner scored the participant's narrative based on story grammar elements (i.e., character, setting, problem, emotion, plan, attempt, consequence, ending, and ending emotion, with a possible total of 16 points), language complexity (i.e., use of cohesive ties such as *then*, *because*, *when*, and *after*, with a possible total of 10 points), and episodes (i.e., attempt + consequence, problem + consequence + ending, with a possible total of 5 points). The pretest total score had good classification accuracy, with children with DLD performing poorer than children without DLD. Story grammar was the strongest predictor (sensitivity = 87%, specificity = 87%, and overall classification = 87%), whereas language complexity was the weakest predictor (sensitivity = 87%, specificity = 56%, and overall classification = 71%). Both language groups obtained a score of 0 for episodes. When language complexity and story grammar were combined, the combination was the best predictor (sensitivity = 84%, specificity = 93%, and overall classification = 89%).

All participants went through four phases of mediation. In the first phase, the examiner retold the story from the pretest while displaying both icons and pictures to the participant. Icons represented visuals for each story grammar component. In addition, the examiner named the parts of the story using story grammar terms such as character, setting, problem, and so forth. In the sec-

ond phase, the participants retold the story from the pretest while using both icons and pictures. In the third phase, the participants retold the story from the pretest while using only icons. In the fourth phase, the participants retold the story from the pretest without visual cues. During Phases 2 through 4, the examiner also provided verbal cueing to help the participants retell the story. Immediately following the mediation phase, the examiner scored modifiability. Modifiability was measured by number of prompts, confidence in retelling, disruptions (e.g., behavior challenges and attention) that occurred during the teaching phase, and rate (how fast the participant completed the task) that, when combined, produced an average learning score defined by a 5-point Likert scale (ranging from 0 to 4; Petersen & Spencer, 2014).

In the posttest, the participants were told a different story by the examiner with equivalent complexity as the pretest narrative. After the story was told by the examiner, the participants retold the story while the examiner scored the retell based on story grammar, language complexity, and episodes. At posttest, the participants in both groups obtained a score for episodes. The posttest score predicted group membership with good accuracy. At posttest, story grammar was the strongest predictor (sensitivity = 84%, specificity = 87%, and overall classification = 86%) and when story grammar, language complexity, and episodes were combined, the combination had excellent classification performance (sensitivity = 89%, specificity = 91%, and overall classification = 90%). However, language complexity and episodes alone were both below 80% accuracy for both sensitivity and specificity.

At both pretest and posttest, story grammar was the best individual predictor in identifying Navajo children with and without DLD. Children with DLD scored lower (*M* = 3.4) than children without DLD (*M* = 5.3) on pretest total scores. Furthermore, children with DLD had difficulty producing story grammar elements in their retells and thus

produced narratives with fewer story grammar components when compared with their typical peers (also see Merritt & Liles, 1987, 1989; Paul et al., 1996).

During the mediation phase of this DA, Navajo children with and without DLD were expected to learn to use story grammar elements to guide their retelling, increase their language complexity, and improve their story retell episode structure. Based on the change in posttest scores, the expected outcomes occurred. In addition, through mediation, the children took more initiative in learning. This supports findings from Tzuriel (2000), who suggested that the mediation phase allows children to become independent in self-regulating the learning process, with the adults taking a more supportive role. Finally, the improvement following mediation was not measured against the child's peers but rather their unique learning needs observed during the learning/teaching phase. Through DA, mediation allows Navajo children to perform above their initial limits when supported by an adult who is familiar with the task.

Navajo children's modifiability in the study by Henderson et al. (2018) allowed them to adapt their cognitive strategies to the changing demands of the task during the DA's mediation phase. Because of their modifiability, the narrative performance of Navajo children with and without DLD increased as a result of the mediation phase. Again, when using DA with narratives for Navajo children, modifiability is reliable and useful to gauge change. The mediation phases allowed the Navajo children to learn storytelling by providing story grammar, language complexity, and episode structure instruction. Furthermore, the mediation phases demonstrated their strengths in an untimed and fair testing situation.

In sum, Navajo children with and without DLD improved their narrative production based on pretest-to-posttest performance gains, as measured by story grammar, language complexity, and episodes. The PEARL provided four mediation phases that ranged from using visual and verbal cuing to no visual or verbal cuing. This use of mediation allowed Navajo children to increase their posttest scores. This suggests that DA supported Navajo children in learning new skills.

CASE STUDY

A girl aged 5 years 6 months participated in our PEARL research study. Her primary language was English and Navajo was her second language. Navajo was the primary language in her home as both her parents and grandparents spoke Navajo. During the time she participated in our study, she was not receiving speech or language therapy. Data such as primary language of the child, primary language in the home, language concerns from parents and teachers, hearing screening, MLU from story retell, *CELF Preschool-2* (Semel et al., 2004) standard scores, and PEARL performance were all collected.

The parent questionnaire indicated no concerns for language in English or Navajo. Her parents indicated that she answered questions spoken in Navajo and could code-switch in her responses. Her bilingual Navajo teacher also reported no concerns for language in English or Navajo. Her teacher indicated that she comprehended lessons in Navajo and English. Furthermore, the teacher reported that she exhibited language skills like that of any typical Navajo child on the reservation.

The language sample was collected in English with some code-switching to Navajo. The sample was analyzed with the Systematic Analysis of Language Transcripts (Miller & Chapman, 2004) by an experienced bilingual SLP. The sample revealed better grammar in English than in Navajo, which was evaluated on the basis of syntax (English syntax [e.g., The boy was sleeping] vs Navajo syntax [e.g., Ashkíí ałwoosh with ntéé deleted to indicate past tense]) and code-switching (e.g., The chał [frog] ran away). However, this was expected, as she produced more English than Navajo. Furthermore, her use of Navajo during code-switching was appropriate for her age as determined by clinical judgment. Her

utterances were longer than those of her typical Navajo peers ($M = 5.0$; +0.75 SDs greater than the comparison group), and she produced more grammatical utterances than her typically developing peers at the age of 5 years 6 months. Overall, her story retell sample indicated that she did not have a DLD.

The *CELF Preschool-2* (Semel et al., 2004) was administered to evaluate language skills; her total standard score was 82, but, of course, because the test did not include Navajo children in the norming sample, this score does not adequately represent her English language ability and should be interpreted with caution. Moreover, her receptive language score (Receptive Language Index = 23) was higher than her expressive language score (Expressive Language Index = 18), which was expected, given that her English production was based on Navajo-influenced language production. However, her language sample did not suggest that she had a DLD.

In the pretest phase of DA, the child received a score 0 for episodes but did receive scores for story grammar and language complexity. She received a score of 4 in story grammar and 2 in language complexity, which gave her a total score of 6. This was below the recommended PEARL cut score of 10 (Petersen & Spencer, 2014). Mediation consisted of four phases, similar to those described previously, but Phases 1 through 3 consisted of both visual and verbal cuing and, in the fourth phase, she was provided with only verbal cuing. In the posttest phase, she was told a different story and she was asked to retell it. She obtained a score of 7 for story grammar, 2 for episodes, and 3 for language complexity—a total of 12, indicating that she improved her storytelling performance using DA. Furthermore, she received a modifiability score of 4, as determined by the average of the four scales (prompts, confidence, disruptions, and rate; Petersen & Spencer, 2014).

It was determined that the child did not have a DLD based on parent and teacher report, the results of the story retell language-sampling analysis, and use of mediation through DA to substantially improve retelling performance. Thus, a story retell language sample and DA assessment can provide adequate information when diagnosing Navajo children with and without DLD. In sum, DA is an appropriate alternative assessment to classify Navajo children without DLD, which may decrease overrepresentation of Navajo children in special education.

CONCLUSION

In sum, overrepresentation of AI children, including Navajo, in special education programs such as speech and language therapy is a multifaceted problem. It is imperative that more research be conducted to support the AI population. Specifically, studies investigating alternative assessments, which can reduce the linguistic and cultural bias frequently seen in norm-referenced assessments, must be a priority for researchers. The use of norm-referenced assessments with AIs has been controversial in the speech and language field. Red flags such as linguistic bias, cultural bias, and inadequate normative samples have been identified in norm-referenced assessments of communication abilities that are typically used by SLPs, yet little has been done to address these issues. This tutorial offers information about some language characteristics of Navajo children, the concerns associated with standardized norm-referenced assessments, and the use of DA as an alternative assessment approach when investigating the language skills of Navajo children with and without DLD. It is recommended that SLPs use alternative assessments to accurately identify Navajo children with DLD, and DA is one such alternative that has shown much promise.

REFERENCES

American Speech–Language–Hearing Association. (1993). Definitions of communication disorders and variations. *ASHA Supplement*, *35*(3 Suppl. 10), 40–41. https://doi.org/10.1044/policy.rp1993-00208

American Speech–Language Hearing Association. (2017). *Issues in ethics: Cultural and linguistic competence.* https://www.asha.org/Practice/ethics/Cultural-and-Linguistic-Competence/

American Speech-Language-Hearing Association. (n.d.). *Cultural competence. (Practice portal).* www.asha.org/Practice-Portal/Professional-Issues/Cultural-Competence/

Arizona Department of Education. (2018). *Arizona 2018 Indian Education Annual Report.* https://www.azed.gov/oie/files/2019/11/8.28.19-AZ-2018-Indian-Education-Annual-Report.pdf

Castilla-Earls, A., Bedore, L., Rojas, R., Fabiano-Smith, L., Pruitt-Lord, S., Restrepo, M. A., & Pena, E. (2020). Beyond scores: Using converging evidence to determine speech and language services eligibility for dual language learners. *American Journal of Speech–Language Pathology*, *29*(3), 1116–1132.

Chamberlain, S. P. (2005). Recognizing and responding to cultural differences in the education of culturally and linguistically diverse learners. *Intervention in School and Clinic*, *40*(4), 195–211. https://doi.org/10.1177/10534512050400040101

Chamberlain, S. P., & Medeiros-Landurand, P. (1991). Practical considerations for the assessment of LEP students with special needs. In E. V. Hamayan & J. S. Damico (Eds.), *Limiting bias in the assessment of bilingual students* (pp. 122–156). PRO-ED.

Civilization Fund Act of 1819, 15 U.S.C. Sess. II. Ch. 85. (1819). https://govtrackus.s3.amazonaws.com/legislink/pdf/stat/3/STATUTE-3-Pg516b.pdf

Crowley, C. (2010). *A Critical Analysis of the CELF-4: The Responsible Clinician's Guide to the CELF-4* [doctoral dissertation]. Available from Dissertations and Theses database. (UMI No. 3420871)

Cummins, J. (1992). The empowerment of Indian students. In J. Reyhner (Ed.), *Teaching American Indian students* (pp. 3–12). University of Oklahoma Press.

de Valenzuela, J. S., Copeland, S. R., Huaquing Qi, C., & Park, M. (2006). Examining educational equity: Revisiting the disproportionate representation of minority students in special education. *Exceptional Children*, *73*(4), 425–441. https://doi.org/10.1177/001440290607200403

Demmert, W. G., (2005). The influences of culture on learning and assessment among Native American students. *Learning Disabilities Research & Practice*, *20*(1), 16–23. https://doi.org/10.1111/j.1540-5826.2005.00116.x

Department of Information Technology. (2011). Welcome to the Navajo Nation Government. Official Site of the Navajo Nation. https://www.navajo-nsn.gov/history.htm

Faircloth, S., & Tippeconnic, J. W. (2000). *Issues in the education of American Indian Alaska Native students with disabilities.* ERIC Digest.

Feuerstein, R. (1970). A dynamic approach to causation, prevention, and alleviation of retarded performance. In C. Haywood (Ed.), *Social–cultural aspects of mental retardation* (pp. 341–377). Appleton, Century, and Crofts.

Feuerstein, R. (1977). Mediated learning experience (MLE): A theoretical basis for cognitive modifiability during adolescence. In P. Mittner (Ed.), *Research to practice in mental retardation: Education and training* (Vol. *2*). University Park Press.

Feuerstein, R. (1979). *The dynamic assessment of retarded performers: The learning potential assessment device, theory, instruments, and techniques.* University Park Press.

Feuerstein, R. (1980). *Instrumental enrichment: An intervention program for cognitive modifiability.* University Park Press.

Feuerstein, R. (1981). Mediated learning experience in the acquisition of kinesics. In R. Sainte-Claire & B. Hoffer (Eds.), *Developmental kinesics: The emerging paradigm*. University Park Press.

Feuerstein, R. (1990). Mediating cognitive processes to the retarded performer. In M. Schwebel, C. Maher, & N. Fagley (Eds.), *Promoting cognitive growth over the life-span*. Erlbaum.

Feuerstein, R., & Rand, Y. (1974). Mediated learning experience: An outline of proximal etiology for differential development of cognitive functions. *Journal of International Council of Psychology*, 9–10, 7–37.

Frankland, H. C., Turnbull, A. P., Wehmeyer, M. L., & Blackmountian, L. (2004). An exploration of the self-determination construct and disability as it relates to the Diné (Navajo) culture. *Education and Training in Developmental Disabilities*, *39*(3), 191–205.

Gutierrez-Clellen, V., & Peña, E. (2001). Dynamic assessment of diverse children: A tutorial. *Language, Speech, and Hearing Services in Schools*, *32*(4), 212–224. https://doi.org/10.1044/0161-1461(2001/019)

Henderson, D. E., & Restrepo, M. A. (2016, November). *Navajo students' performance on the CELF-4.* American Speech-Language–Hearing Association Convention.

Henderson, D., & Restrepo, M. A. (2017, April). *Culture and language consideration for Navajo children on standardized and dynamic assessments.* The Arizona Speech–Language–Hearing Association.

Henderson, D. E., Restrepo, M. A., & Aiken, L. S. (2018). Dynamic assessment of narratives among

Navajo preschoolers. *Journal of Speech, Language, and Hearing Research*, *61*(10), 2547–2560. https://doi.org/10.1044/2018_JSLHR-L-17-0313

King, D. F., & Goodman, K. S. (1990). Whole language: Cherishing learners and their language. *Language, Speech, and Hearing Services in Schools*, *21*(4), 221–227. https://doi.org/10.1044/0161-1461.2104.221

Kozulin, A. (2002). Sociocultural theory and the mediated learning experience. *School Psychology International, 23*(1), 7–35. https://doi.org/10.1177/0143034302023001729

Kozulin, A., & Presseisen, B. Z. (1995). Mediated learning experience and psychological tools: Vygotsky's and Feuerstein's perspectives in a study of student learning. *Educational Psychologist*, *30*(2), 67–75.

Kramer, K., Mallett, P., Schneider, P., & Hayward, D. (2009). Dynamic assessment of narratives with grade 3 children in a First Nations community. *Canadian Journal of Speech–Language Pathology and Audiology*, *33*, 119–128.

Lalkhen, A. G., & McCluskey, A. (2008). Clinical tests: Sensitivity and specificity. *Continuing Education in Anesthesia: Critical Care and Pain*, *8*(6), 221–223. https://doi.org/10.1093/bjaceaccp/mkn041

Leap, W. (1993). *American Indian English.* University of Utah Press.

Lidz, C. S. (1991). *Practitioner's guide to dynamic assessment.* Guilford.

Lidz, C., & Peña, E. (1996). Dynamic assessment: The model, its relevance as a nonbiased approach, and its application to Latino American preschool children. *Language, Speech, and Hearing Services in Schools*, *27*(4), 367–372. https://doi.org/10.1044/0161-1461.2704.367

Merritt, D. D., & Lilies, B. Z. (1987). Story grammar ability in children with and without language disorder: Story generation, story retelling, and story comprehension. *Journal of Speech and Hearing Research*, *30*(4), 539–552. https://doi.org/10.1044/jshr.3004.539

Merritt, D. D., & Lilies, B. Z. (1989). Narrative analysis: Clinical applications of story generation and story retelling. *Journal of Speech and Hearing Disorders*, *54*(3), 438–447. https://doi.org/10.1044/jshd.5403.438

Miller, J. F., & Chapman, R. S. (2004). *Systematic analysis of language transcripts* (Version 8.0) [Computer software and manual]. Language Analysis Laboratory, Waisman Center, University of Wisconsin–Madison.

Miller, L., Gillam, R. B., & Peña, E. D. (2001). *Dynamic assessment and intervention: Improving children's narrative skills.* PRO-ED.

Morris, R., Pae, H. K., Arrington, C., & Sevcik, R. (2006). The assessment challenge of Native American educational researchers. *Journal of American Indian Education*, *45*(3), 77–91.

National Center for Educational Statistics. (June, 2016). Digest of education statistics. https://nces.ed.gov/programs/digest/d15/tables/dt15_221.10.asp

National Research Council. (1994). *Cultural diversity and early education: Report of a workshop.* The National Academies Press. https://doi.org/10.17226/9297

Native American Languages Act of 1990, 25 U.S.C. Ch. 31. § 2901 et seq. (1990). https://www.govinfo.gov/content/pkg/STATUTE-104/pdf/STATUTE-104-Pg1152.pdf

Norris, T., Vines, P. L., & Hoeffel, E. M. (2012, January). *The American Indian and Alaska Native Population: 2010*. 2010 Census Briefs. United States Census Bureau. https://www.census.gov/history/pdf/c2010br-10.pdf

Paul, R., Hernandez, R., Taylor, L., & Johnston, K. (1996). Narrative development in later talkers: Early school age. *Journal of Speech and Hearing Research*, *39*(6), 1295–1303. https://doi.org/10.1044/jshr.3906.1295

Paul, R., Norbury, C., & Gosse, C. (2018). *Language disorders from infancy through adolescence: Listening, speaking, reading, writing, and communicating* (5th ed.). Elsevier.

Peña, E. (1993). *Dynamic assessment: A nonbiased approached for assessing the language of young children.* Unpublished doctoral dissertation, Temple University, Austin, TX.

Petersen, D. B., & Spencer, T. D. (2014). *Predictive early assessment of reading and learning (PEARL)*. Language Dynamics Group.

Plante, E. (1998). Criteria for SLI: The Stark and Tallal legacy and beyond. *Journal of Speech, Language, and Hearing Research*, *41*(4), 951–957. https://doi.org/10.1044/jslhr.4104.951

Salvia, J., & Ysseldyke, J. E. (2004). *Assessment in special and inclusive education* (9th ed.). Houghton Mifflin.

Semel, E., Wiig, E. H., & Secord, W. A. (2003). *Clinical evaluation of language fundamentals, fourth edition (CELF-4)*. The Psychological Corporation/A Harcourt Assessment Company.

Semel, E., Wiig, E. H., & Secord, W. A. (2004). *Clinical evaluation of language fundamentals—Preschool-2 (CELF-Preschool-2)*. Pearson.

Todacheeny, F. (2014). *Navajo Nation in crisis: Analysis on the extreme loss of Navajo language use amongst youth*. Unpublished doctoral dissertation, Arizona State University, Tempe, AZ.

Tzuriel, D. (2000). Dynamic assessment of young children: Educational and intervention perspectives. *Educational Psychology Review*, *12*(4), 385–435.

Ukrainetz, T., Harpell, S., Walsh, C., & Coyle, C. (2000). A preliminary investigation of dynamic assessment with Native American kindergartners. *Language, Speech, and Hearing Services in Schools*, *31*(2), 142–154. https://doi.org/10.1044/0161-1461.3102.142

U.S. Department of Education. (1991, October). *Final report of the Indian Nations at risk task force*. https://www2.ed.gov/rschstat/research/pubs/oieresearch/research/natatrisk/report.pdf

U.S. Department of Education, National Center for Education Statistics. (2020). *The condition of educational 2020* (NCES 2020-144). https://nces.ed.gov/programs/coe/indicator_coj.asp

Vining, C., Edgarita, L., Inglebret, E., & Brendal, M. (2017). Speech-language assessment considerations for American Indian and Alaskan Native Children who are dual language learners. *Perspectives of Special Interest Groups*, *2*(Sig. 14), 29–40.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes.* Harvard University Press.

Vygotsky, L. S. (1986). *Thought and language.* MIT Press.

Wiig, E. H., Semel, E., & Secord, W. A. (2013). *Clinical evaluation of language fundamentals-fifth edition (CELF-5)*. NCS Pearson.

Young, R., & Morgan, W. (1987). *The Navajo language*. University of New Mexico.