Dynamic Assessment of Narratives with Grade 3 Children in a First Nations Community

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Abstract

Diagnostic accuracy of the *Dynamic Assessment and Intervention* (DAI) tool (Miller, Gillam & Peña, 2001) was examined with 17 Grade 3 children belonging to a First Nations community who were classified either as normal language learners (NLL) or as having possible language learning difficulties. The DAI was designed to provide a culturally sensitive evaluation of language learning abilities. Results showed that both groups benefited from direct teaching of specific targets, but children in the NLL category benefited to a greater extent and generalized more often to targets not directly addressed. A discriminant analysis resulted in high specificity and sensitivity. These results suggest that DAI is a useful diagnostic tool for identifying children with language learning difficulties in this population.

Abrégé

Key words: dynamic assessment, language assessment, narratives, First Nations children

This paper describes our attempt to use the *Dynamic Assessment and Intervention* (DAI) tool (Miller, Gillam, & Peña, 2001), described as a culturally sensitive language assessment tool, to distinguish language difference and possible language disorder within a First Nations community in Alberta. Language assessment methods may contain cultural biases (Langdon, 1989; Peña, Quinn, & Iglesias, 1992). Cultural bias occurs when assessment tools that are developed based on expectations about skills for the dominant cultural group are used with another group for whom those expectations are not appropriate. For example, a child from a non-mainstream cultural group may fail to attain an adequate score on a measure because of a lack of familiarity with a task and not because of an impairment, resulting in an inappropriate referral for services. Those assessing language abilities need

to be aware of these biases (Gillam, Peña, & Miller, 1999; Gutierrez-Clellen & Iglesias, 1992; Terrel & Terrel, 1983). Cultural bias may result in underestimation of the ability of children from minority cultures (Terrel & Terrel, 1983). It is imperative to find methods that will minimize cultural bias so that children who truly require intervention are uniquely identified.

Dynamic assessment has been proposed as an alternative method of assessment when the language of individuals belonging to a minority culture is evaluated (Carter et al., 2005; Hwa-Froelich & Vigil, 2004; Lidz & Peña, 1996; Peña, 2000). It has been suggested that dynamic assessment is a method that can help to differentiate children who may have language disorders from those who perform less well on individual static testing for other reasons, such as lack of familiarity with a task.

Dynamic Assessment

In traditional speech-language assessment, static knowledge-based measures have been used to evaluate the communicative abilities of clients, but there has been a movement toward process-oriented approaches. A static approach focuses on the immediate linguistic output during testing, judging distinct aspects of linguistic performance in isolation (Ellis-Weismer & Evans, 2002). A process-based approach referred to as *dynamic assessment* focuses not only on what an individual can accomplish independently, but also on the benefits that occur through further instruction (Gillam & McFadden, 1994; Olswang & Bain, 1996). Dynamic assessment models have been greatly influenced by Vygotsky's theory of cognitive development (Vygotsky, 1986) and Feuerstein's mediated learning experience (Feuerstein, Rand, & Hoffman, 1979). According to Vygotsky, children develop through social interaction with those in their environment who are more proficient in the language and culture. Vygotsky proposed that a child's ability to learn could be assessed by comparing the difference between a child's independent level of functioning and the higher level of functioning that they may achieve through adult support and help, which Vygotsky termed the *zone of proximal development* (ZPD). The amount of assistance that a child needs in the ZPD indicates how close the child is to the next level of independent functioning. Vygotsky hypothesized that for two children with the same level of independent functioning, a child who needed less assistance to exhibit a higher level of functioning was closer to mastering the skill at an independent level than was a child who needed more assistance to reach that higher level.

Based on Vygotsky's notion of the ZPD, Feuerstein developed the concept of *mediated learning experience* (MLE), a form of learning that occurs when a mediator intercedes between the learner and environmental factors (Feuerstein, 1990; Feuerstein et al., 1979; Feuerstein, Rand, Hoffman, & Miller, 1980). The mediator's purpose in this interaction is to help the learner interact more efficiently and productively with learning materials (Kozulin & Presseisen, 1995). The key to successful dynamic assessment is determining a learner's independent achievement level and then working with the learner just beyond that level in an MLE.

Typically, a dynamic assessment consists of three phases: *test*, in which the testee's individual abilities are observed in a task with minimal assistance from the examiner; *teach*, in which the examiner assists the testee in tasks similar to those used in the test phase; and *re-test*, in which the testee is once again tested independently. Success of the intervention is measured by change from test to re-test phases.

Using Dynamic Assessment to Control for Cultural Bias

Dynamic assessment is thought to be appropriate for identifying children in need of long-term intervention because it highlights not only current knowledge and skills but also the child's ability to learn. Children who do not demonstrate a skill independently but quickly acquire the skill with brief mediation are considered capable learners, whereas children who do not benefit from short-term mediation are considered candidates for more intensive intervention (Olswang & Bain, 1996). Peña and colleagues (Lidz & Peña, 1996; Peña et al., 1992; Quinn, Goldstein, & Peña, 1996) argue that dynamic assessment should thus be able to distinguish children from other cultures who have not acquired skills due to different experiences and cultural practices from other children in the same culture who have learning problems. Peña et al. (1992) used the dynamic assessment model to investigate the effects of mediation on Latino-American and African-American preschool children with no disorders and those with possible language disorders. Children's language was initially assessed through standardized language and intelligence testing, parent/teacher reports, and classroom interaction observations. Dynamic assessment procedures involved a test–teach–retest methodology in which mediation involved activities focused on developing labeling strategies. Results indicated that child modifiability on the labeling strategies task and post-mediation standardized test scores (*Expressive One Word Picture Vocabulary Test*, Gardner, 1979) differentiated children with typical or low language ability from those with no disorders better than pre-test performance.

Ukrainetz, Harpell, Walsh, and Coyle (2000) completed a preliminary investigation of dynamic assessment methods for assessing language-learning ability with Native American kindergarten children. Based on teacher report and examiner classroom observation, 23 kindergarten children from an Arapahoe/Shoshone cultural background were split into groups of stronger ($n = 15$) or weaker ($n = 8$) language learners. Mediation focused on categorization of objects. Their study found that modifiability and post-test scores were significantly higher for stronger language learners than for weaker language learners.

Narratives as a Context for Assessment

Narrative assessment would appear to be an appropriate context for dynamic assessment for children

in general and for First Nations children in particular. Historically, the First Nations peoples of Canada have had a strong oral tradition with an emphasis on oral storytelling (Darnell, 1974; Howard, 1999; Wilson, 1996). The oral narrative tradition is recognized as an important part of First Nations culture (Einhorn, 2000).

Westby (1994) suggests that narrative assessment, which focuses on textual language abilities rather than on knowledge of discrete aspects of language such as semantics and syntax, appears to be more sensitive to the language requirements of school than to standardized discrete-point tests. Numerous studies have shown that school-age children with language impairments have difficulty telling stories (Fey, Catts, Proctor-Williams, Tomblin, & Zhang, 2004; Gillam & Johnston, 1992; Gillam, McFadden, & van Kleeck, 1995; Liles, Duffy, Merritt, & Purcell, 1995). Children with language impairments tell stories that have fewer story grammar components and episodes (Paul, Hernandez, Taylor, & Johnson, 1996; Schneider, Hayward, & Dubé, 2006), reduced sentence complexity (Gillam & Johnston, 1992), fewer cohesive ties and incomplete cohesive ties (Liles, 1985), more grammatical errors (Gillam & Johnston, 1992; Liles et al., 1995; Norbury & Bishop, 2003), and poorer overall story quality (Gillam et al., 1995; McFadden & Gillam, 1996; Paul et al., 1996).

Oral narratives are an ideal medium for testing language of children cross-culturally because they are a major genre in cultures that are primarily oral as well as those that are highly literate (Ong, 1982). According to Westby (1994), narratives are a universal genre and therefore provide an appropriate medium for evaluating language cross-culturally.

It has been noted that cultural preferences for story-telling can vary across cultures. Distinctive aspects of preferred style in First Nations storytelling have been reported (Scollon & Scollon, 1984). For example, audience participation is an important aspect of Athabaskan Indian storytelling, as audiences are encouraged to reply with an *ehe* (yes) at the end of each verse (Scollon & Scollon, 1984); such participation might be inappropriate in other cultures. Westby (1994) suggests that Native American narratives represent a different view of space, time, and motion than narratives from Western cultures. As an example, she points out that Navaho storytellers tend to devote much of their time to describing walking, the landscape, and places passed, with relatively less time spent on actions. In addition, cultures may have recurring themes in stories (such as trickster stories among many First Nations groups) that are easily recognized within the culture but which may be difficult to comprehend for those from other storytelling traditions.

However, it has been argued that despite cultural differences that may exist in terms of style or preferred content, basic narrative structure is universal, at least within a standardized context (Westby, 1994). A study by Mandler, Scribner, Cole, and Deforest (1980) found that upon presentation of a basic story, adults from another culture (both schooled and unschooled members of the Vai people of Liberia) provided essentially the same information when retelling the story as had Western people in previous research, suggesting there are some story formats that are common and universal. Mandler et al. (1980) obtained this result in a condition when all participants were presented with a story to retell. This suggests that when presented with a standardized story, participants will tell a story that conforms to a structure that is recognizable across cultures. Similar results have been found in studies of native North American children. Hedberg, Ochsner, and Fink (1988), as cited in Kay-Raining Bird & Vetter (1994), found no differences in story retellings of rural Arapahoe children and age-matched mainstream American children. Kay-Raining Bird and Vetter (1994) did find some differences in story recall amongst children of a Chippewa–Cree community. Children whose primary caregiver was considered "traditional" produced stories that were more highly structured in general than children whose primary caregiver was considered "nontraditional." This same study also found, however, that episodic structure in the story recalls was similar for all children. Overall, the evidence suggests that when using stories with a given structure, First Nations children will recall the structures in ways similar to non-First Nations children. Despite differences that may exist in terms of style or preferred content, when presented with a basic story, speakers from different cultures will recognize and reproduce core elements of story structure.

Dynamic Assessment of Narratives

The assessment tool *Dynamic Assessment and Intervention* (DAI; Miller et al. 2001) was designed to assess narrative language abilities in a culturally sensitive manner. Based on Vygotsky's and Feuerstein's theories, the DAI permits estimation of the *modifiability* of language in a manner thought to be neutral to experience, economics, and culture because it centers on linguistic growth in a social setting (Gillam et al., 1999). The DAI's focus on narrative abilities to determine a child's level of linguistic learning potential and its use of dynamic assessment are the two main reasons this tool was chosen for the present study. The DAI is intended to provide a method of assessment that is not culturally biased and that can distinguish children in need of intervention from those who need just a brief intervention in order to tell adequate stories.

Present Study

The present study seeks to investigate a similar question asked by Ukrainetz et al. (2000), namely, whether a dynamic assessment would differentiate children with normal language learning (NLL) abilities from children with possible language learning difficulties (PLLD). However, in the current research we used a narrative context, specifically, DAI.

The purpose of this study was to determine the accuracy of the DAI in distinguishing possible language delay from language difference with a group of Grade 3 First Nations

children. The authors of the DAI claim that it examines the modifiability of language, independent from experience, economics, and culture. To test this claim with our target population, the following questions were addressed:

1) Will children with normal language learning (NLL) abilities show greater improvement after the teach phase of the DAI than children with possible language learning disorders (PLLD)?

2) Using variables that are used in the DAI to determine the identification of language learning disorders, will classification of children into NLL and PLLD groups based on DAI results agree with classification into groups by school personnel?

Methods

Participants

The 17 participants involved in this study were Grade 3 children from three classrooms on the Samson Cree Nation Reserve in Alberta, Canada. These children received instruction in English, with Cree taught in an alternative language class. Consent forms were sent to the parents/guardians of all the children attending Grade 3 at this school. The special education teacher, the Grade 3 teachers, and the principal were asked to provide input regarding the presence or absence of language-learning difficulties based on previous speech-language pathology assessment, classroom performance, and classroom observation. Specifically, they were asked to identify children who had been previously identified as having language difficulties or who they suspected had language difficulties based on their knowledge of the children. Five of the children were labeled as having PLLD by these school personnel. Twelve children were considered to have NLL abilities. Information on group membership was given to the third author. The first two authors served as examiners and were blind regarding group information (PLLD or NLL) until after all testing, intervention, and scoring was completed. The examiners did not discuss the children's language status with school personnel during the course of the study.

Materials

The DAI (Miller, Gillam, & Peña, 2001) evaluates oral narrative abilities using two wordless storybooks. The DAI uses a *test-teach-retest* format. In the *test* phase, a child creates a narrative from one wordless picture book with no assistance from the examiner. Then the child participates in supported mediation sessions focused on narrative elements (*teach* phase). Finally, in the *retest* phase, the child again produces a narrative without assistance from the other wordless picture book. The DAI provides scoring criteria for narratives produced in the test and retest phases across several dimensions: number and quality of story components included (setting, character information, temporal order of events, and causal relationships), story ideas and language used within each story (complexity of ideas, complexity of vocabulary, grammatical complexity, knowledge of dialogue, and creativity), and episode

elements and structure present in each story (initiating event, attempt, consequence, internal response, plan, and reaction/ending). The DAI also provides scoring criteria for teacher effort and child modifiability during the teach component (described in the next section). The two picture books that come with the DAI, *Two Friends* and *The Bird and His Ring*, have been shown to elicit equivalent total story scores and productivity measures (Peña et al., 2006).

Procedure

Each child was seen individually by one of the two examiners. Sessions were conducted in a quiet room with only the child and examiner present. Sony Mini Disc audio recorders were used to record the stories told by each child during each phase of the study. Procedures described in the DAI manual were followed, as described below.

Test Phase

The first session included a 5- to 10-minute interview during which time was spent talking to the child to familiarize the child with the examiner. The wordless picture book *Two Friends* was presented to the child to peruse in order to develop a story to accompany the pictures. The child then orally narrated the book. This provided the test phase performance score for narrative production. The examiner responded to the child only with neutral responses such as "uh-huh," "oh," or "okay." The story was audio-recorded and later transcribed onto the DAI Story Record Form. From the transcribed record, each examiner evaluated and scored the story following the DAI scoring protocol. This consisted of assigning a numerical value between 1 and 5 for each narrative component. An assignment of 1 would indicate a complete lack of the component within the narrative while an assignment of 5 indicated a complex and complete insertion of the component within the narrative. For example, if a child did not include story setting information for time or place when narrating the story, a score of 1 would be assigned. If a child included setting information for either time or place, a score of 3 would be assigned. If a child included setting information that included time and place, a score of 5 would be assigned. All of the scoring scales have 5 points except for Episode Elements and Structure, which has 7 points.

Teach Phase

Each child participated in two mediation sessions. The first of the two sessions took place an average of 3 days after the test phase session (range 1–5 days). The DAI manual instructs the examiner to mediate one component that was assigned a score of 1 or 2, which indicates little or no knowledge of this component, and one component that was assigned a score of 3 or 4, which indicates some knowledge of this element, in the child's test phase story production. The DAI manual provides structured outlines for mediation strategies for each story component area. Each outline begins with an intention to teach that provides a clear explanation of what is going to be addressed. The next step involves explaining the meaning of the story component in relation to telling a story by giving examples

from the *Two Friends* test story. For example, to mediate setting information, the examiner and child would look at the storybook and collaborate on the story setting by coming up with words and phrases about when and where the animals are at the beginning of the story. The next step is to help the child plan how to incorporate the particular story component when narrating stories in the future. Finally, there is a transfer step used to summarize the session and encourage the child to develop ways to remember what was learned. Examiners also record the type of support provided to each child and how the child responded to this support. The second mediation session followed the same procedure but with the other story component that had been identified for mediation for that child. The second session was conducted the day after the first except in one case where the session took place 2 days later.

Following each mediation session, children were rated on two scales. On the first scale the examiner assigned a numerical value between 1 and 5 to describe the amount of effort required to teach the child, where 1 = *a lot* (constant effort and continuous examples were required) and 5 = *little* (few or no principles or examples stated). For the second scale the examiner assigned a numerical rating between 1 and 5 to describe child responsiveness to the teaching, where 1 = *not very* (constant support was required) and 5 = *very* (needed very little support).

Re-test Phase

Post-testing was conducted an average of 10 days after the initial test phase session (range 7–12 days). The procedures were identical to the test phase, except that each child was presented with the other wordless picture book from the DAI, *The Bird and His Ring*. Time was allowed for the child to become familiar with the storybook before the child narrated a story. This story was transcribed from the audio-recording and then evaluated and scored according to the DAI guidelines.

Inter-rater Reliability

The 17 children were randomly divided into two groups. Each examiner transcribed the stories of the children in one of the two random groups. After transcription, each examiner scored the transcripts of her group according to the scoring criteria of the DAI. Once scored, each examiner reviewed the transcripts and scoring done by the other examiner. Final scoring decisions were reached through consensus between the two examiners.

Statistical analyses were conducted using SPSS software (SPSS Inc., 2004).

Results

Overall Effect of Mediation

Our first research question was whether DAI test-to-retest phase score differences would be greater for children identified as NLL than for children identified as having PLLD. All components were rated on a 5-point Likert scale, except for one, Episode Elements and Structure, which was rated on a 7-point scale. To equate this scale to the

others, ratings were converted to the equivalent score on a 5-point scale (e.g., a score of 5/7 was converted to 3.57/5). We summed the ratings of all variables for each story to create the variable total narrative score. We then conducted an analysis of variance with *group* as the between-subjects variable and *time* as the within-subjects variable.

There was no main effect for group based on total narrative scores, $F(1, 15) = 0.48$, $p = .50$, partial $\eta^2 = .03$. There was a significant effect for time, $F(1, 15) = 28.15$, $p < .001$, partial $\eta^2 = .65$, and most importantly, a significant Group x Time interaction, $F(1, 15) = 16.53$, $p = .001$, partial $\eta^2 = .52$. The effect size for the interaction indicates that 52% of the variance was accounted for by the interaction between these variables. The significant interaction between group and time indicates that test–retest score differences were indeed greater for the NLL group than for the PLLD group. The interaction effect, illustrated in Figure 1, indicates that DAI scores were similar for groups at the test phase but increased more for children with NLL after the mediation sessions.

Classification Agreement

The data were also examined to determine to what degree conclusions drawn from the DAI agreed with the classification of children into groups (NLL or PLLD) by school personnel. School classification was the result of a collaborative decision by classroom and special education teachers and the principal about the students' language learning abilities and was based on previous speech-language pathology assessment, academic performance, and classroom observation.

To determine whether the results of the DAI mediation were successful in distinguishing between children with normal language-learning abilities and those who had a possible language-learning disability, we used discriminant analysis (Klecka, 1980). Discriminant analysis can be used to investigate whether and to what extent a measure or set of
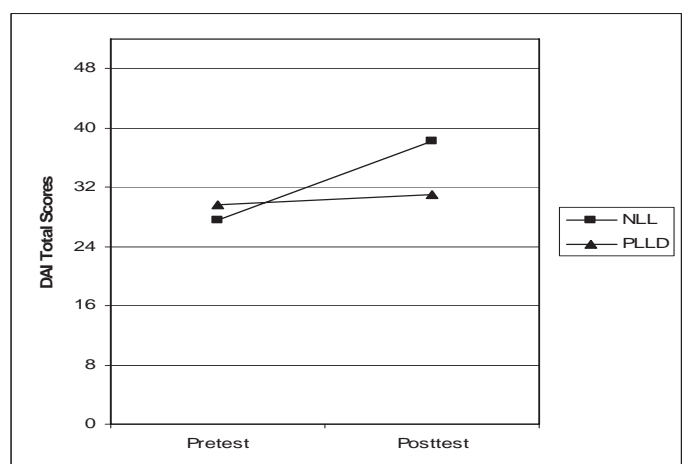

Figure 1. Pretest and posttest DAI total scores by group (maximum score = 52). NLL = normal language learning; PLLD = possible language learning disorders.

measures classifies participants into the correct pre-existing groups (in this case, children with and without possible language-learning difficulty). Discriminant analysis is recommended as standard practice for establishing that a particular test can be used to identify children with language impairments (Plante & Vance, 1994). Because we were interested in how well the DAI would distinguish among the groups when used as an assessment tool, we selected measures that corresponded to DAI criteria for determining whether a child is a "capable language learner" or "exhibits language-learning difficulty." According to the DAI criteria, to be considered a capable language learner, a child needs to (a) improve at least one point both on components that had been focused on in mediation sessions and on components that were not included in mediation and (b) receive ratings of 4 or 5 on the 5-point scales for teaching effort and student responsiveness. The DAI distinguishes between two types of children with language-learning difficulty (L-LD): those who are ready to benefit from mediated teaching and those who are not ready. Our concern for this study was to investigate the ability of the DAI to distinguish between children with and without L-LD, regardless of whether or not the latter children were ready for intervention. Thus we combined the criteria for the two groups of L-LD. Criteria for identification as having L-LD are: (a) mediation results in a 1-point or less increase in components targeted; (b) mediation results in no change in non-targeted components; (c) teaching effort is rated from 1 to 3; and (d) student responsiveness is rated from 3 to 5 for those ready to benefit from intervention and from 1 to 2 for those not yet ready. Based on these criteria, we selected the following measures for the discriminant analysis: *average change on targeted components* (average for each child on the two components chosen for the mediation phase), *average change on non-targeted components* (average change for each child on the components that were not addressed in the mediation phase), *student responsiveness* (total of the ratings for the two mediation sessions), and *teaching effort* (total of the ratings for the two sessions). Figures 2 and 3 display the means and standard deviations for these variables.

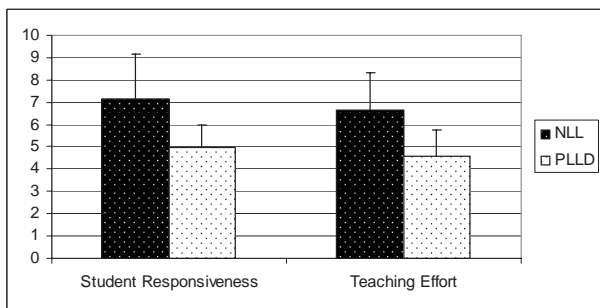Note that when combining the criteria for those ready for remediation and those not ready for remediation,

Criterion 3 for L-LD covers the entire range of possible student responsiveness scores (1–5). However, because student responsiveness is one of the DAI's criteria for identifying children with L-LD, and because we expected that student responsiveness would differ in our two groups, we decided to include this measure in the variables for the discriminant analysis.

As a first step, a MANOVA was calculated in order to determine whether the groups differed on the variables. The multivariate test was significant, Pillai's Trace $(4, 12) = 4.94$, $p = .014$, partial $\eta^2 = .62$. Univariate tests were corrected for multiple tests using Holm's procedure for multiple tests (Wright, 1992). All four tests were significant. Cohen's *d* effect sizes were moderate for average change in targeted components and large for the other three variables. See Table 1 for the univariate test results. Table 2 presents the intercorrelations among the variables. All variables were correlated except for average change in non-targeted components, which correlated only with average change in targeted components.

Next, the discriminant analysis was conducted using the four variables, entered in one step. As part of the analysis, a discriminant function is calculated, which is a mathematical formula that combines the predictor variables to discriminate between the groups (Brace, Kemp, & Snelgar, 2003). If the discriminant function is statistically significant, then the predictor variables are successfully discriminating between groups. The value of the discriminant function was significantly different for the NLL and PLLD groups, Wilks' $\Lambda = .38, \chi^2 = 12.66, df = 4, p = .013$. The discriminant functions at group centroids were .903 for the NLL group and -2.167 for the PLLD group, indicating discrimination between the groups. Table 3 shows the correlations between the variables and the discriminant function. The magnitude of the correlations indicates the strength of the prediction of each variable. Correlations between predictor variables and the discriminant function indicate that the best predictor variable appears to be average change in targeted components, followed by average change in non-targeted components.

Table 4 shows the classification of children by school personnel and by DAI classification. We found a 94.1% agreement overall between the DAI classification and

Figure 2. Means for average change from test to retest on targeted and non-targeted DAI story components. NLL = normal language learning, PLLD = possible language learning disorders.
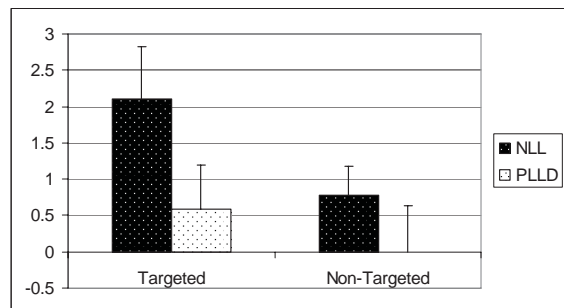

Figure 3. Mean ratings for student responsiveness and teaching effort. NLL = normal language learning, PLLD = possible language learning disorders.

school personnel classification. Specificity (i.e., number of children in the NLL group who were identified as such by the DAI) was 91.7%; only one child from the NLL group was misclassified as PLLD. On student responsiveness and teaching effort, this child received ratings of 1 in the first session and 3 in the second session, which were under the DAI capable language learner's criterion of 4 or more for each score. The child increased an average of .5 points on both targeted and non-targeted components. All children in the PLLD group were classified as such by the DAI results; thus sensitivity was 100%.

To investigate whether all four variables were necessary to discriminate the groups, the discriminant analysis was repeated using only average change in targeted components and average change in non-targeted components. Specificity, sensitivity, and overall accuracy remained exactly the same using only these two variables. We repeated the analysis a third time using only student responsiveness and teaching effort; specificity (75%) and overall accuracy (82.4%) were reduced, with two additional NLL children being misclassified as PLLD, while sensitivity remained at 100%.

It should be noted that despite the high specificity obtained in the discrimination analysis, some of the children in the NLL group were rated lower than 4 on the student responsiveness and/or teaching effort scores and thus would not have met the DAI criteria for capable language learners. However, these children obtained average change scores well above the criterion of 1 or more, which resulted in their classification as capable language learners in the discriminant analysis. Tables 5 and 6 indicate whether each criterion was met for each individual child. While most children meet the criteria for their group, a few children failed to meet the criterion for teaching effort and/or student responsiveness.

Discussion

This study examined the use of dynamic assessment within a First Nations community using the DAI. The DAI was examined because it focuses on a child's ability to tell stories, which is a skill that is found across cultural boundaries. It is important to test potential assessment tools, such as the DAI, that have a more suitable format for a variety of cultures as Canada has an abundance of cultures whose language needs may be more appropriately assessed with a culturally sensitive tool. This study examined the power of the DAI to distinguish between children with normal language learning abilities and those with a possible language learning disorder.

Overall effect of mediation on story scores

Our first research question was whether test-to-retest changes in DAI narrative measures would be significantly higher with the NLL group than with the PLLD group. As is apparent in Figure 1, the two groups were similar at the test phase, but after mediation their story scores were different. While both groups changed over time, those who were capable learners (NLL) benefited more from the one-

Table 1

Univariate Test Results for Variables in the Discriminant Function Analysis

Variable	Univariate F	p	Partial η^2	Cohen's d
Average change in mediated components	16.45	.001*	.52	1.0
Average change in non-mediated components	9.44	.008*	.39	0.60
Student responsiveness	5.21	.037*	.26	1.38
Teaching effort	6.30	.024*	.30	1.45

*p < adjusted alpha using Holm's procedure (Wright, 1992).

Table 2

Correlations Among Variables in the Discriminant Function

	Student respon-siveness	Teaching effort	Average change in targeted components
Teaching effort	.77**	—	
Average change in targeted components	.58*	.55*	—
Average change in non-targeted components	.38	.20	.49*

*p < .05, **p < .01.

Table 3

Correlations Between Predictor Variables and the Discriminant Function

Variable	Correlation
Student responsiveness total of ratings	.46
Teaching effort total of ratings	.51
Average change in targeted components	.82
Average change in non-targeted components	.62

Table 4

Numbers of Children Classified as NLL or PLLD by School Personnel and by Test Results

Test classification	School classification	
	NLL	PLLD
Capable language learner	11 (91.7%)	1 (8.3%)
Language–learning difficulty	0	5 (100%)

Note. Overall rate of classification agreement = 94.1% (16/17).

on-one instruction during the mediated sessions than the PLLD group. The results suggest that children in the PLLD group had more difficulty learning and incorporating new information into their storytelling.

Discrimination between groups

Group comparisons on variables in the discriminant analysis

Comparisons between the NLL and PLLD groups revealed that both the targeted and non-targeted components changed more for the NLL group than the PLLD group. The change in the non-targeted components in the NLL group suggests a transfer of the narrative teaching to the other components. There was some positive change in the PLLD group in the targeted components (as seen in Figure 3), but no change is seen in non-targeted

components as it is with the NLL group. While the PLLD group did not benefit as much overall, they did improve in the components that were taught in a very direct and focused way, if only slightly. Unlike their typical language peers, these children demonstrated no skill transfer in the same period of time; this difference is expected with the DAI procedure and, in fact, is one of the criteria for differentiating capable language learners from those exhibiting language-learning difficulty. It is likely that the children in the PLLD group require a longer period of time to consolidate new information. Our results support the need for direct and focused instruction for children with possible language learning difficulties.

The two groups differed on the teaching effort and student responsiveness ratings that were completed after the mediation sessions. These group differences indicate

Table 5

DAI Criteria for Capable Language Learner by Child for Children Classified as Normal Language Learners by School Personnel

Participant	Student responsiveness[a]	Teaching effort[a]	Increase in targeted variables	Increase in non-targeted variables[b]	Total criteria met
NLL1	+	+	+	+	4
NLL2	−	+	+	+	3
NLL3	+	+	+	+	4
NLL4[c]	−	−	−	+	1
NLL5	+	+	+	+	4
NLL6	+	+	+	+	4
NLL7	+	−	+	+	4
NLL8	−	−	+	+	2
NLL9	+	+	+	−	3
NLL10	+	+	+	+	4
NLL11	+	+	+	+	4
NLL12	+	+	+	+	4

[a]Rated as 4 or 5 for one or both mediated sessions. [b]Increase of +1 or more in at least 3 untargeted variables. [c]This was the child from the NLL group who was classified as PLLD in the discriminant analysis.

Table 6

DAI Criteria for Language-Learning Difficulties by Child for Children Classified as having Possible Language-Learning Difficulties by School Personnel

Participant	Student responsiveness[a]	Teaching effort[b]	Increase ≤ 1 on targeted variables	No increase in non-targeted variables[c]	Total criteria met
PLLD1	+	+	+	+	4
PLLD2	+	+	+	+	4
PLLD3	+	+	+	+	4
PLLD4	+	+	+	−	3
PLLD5	+	+	+	+	4

[a]For student responsivity, a child can score anywhere from 1–5 and be considered L-LD; a score of 1 would indicate that the child would not be ready to benefit from intervention. All PLLD children in this study scored 2 or 3 on this variable in at least one session. [b]For teaching effort, a child can be considered ready to benefit from intervention if he/she scores from 1 to 3 (although a 1 on both this variable and student responsiveness would indicate a child who is not ready to benefit from intervention). All PLLD children scored 2 or 3 on this variable in at least one session. [c]Defined as change of +1 point in fewer than 3 untargeted variables.

that children in the NLL group were rated as requiring less effort to teach and being more responsive to mediation than children in the PLLD group.

Classification Agreement

The discriminant analysis investigated whether the DAI classification would provide an accurate classification compared to the school personnel classification. Using variables related to criteria specified in the DAI manual for distinguishing between children with and without language-learning difficulties, the discriminant analysis indicated that the DAI test classification places the children into similar groups as the school personnel classification in the majority of cases. Only one NLL child was misclassified as PLLD, while no PLLD children were misclassified. Thus, conclusions that would be drawn from the DAI agree very well with classifications made by school personnel.

Our findings regarding student responsiveness and teaching effort differ from those of Peña et al. (2006), who found that their modifiability score (the sum of student responsiveness and teaching effort ratings) was the single most accurate measure in their discriminant analysis. Given the many differences between their study and ours (e.g., their participants were in Grades 1 and 2 and had different cultural backgrounds), it is not possible to determine the reason for the different results. It seems possible, however, that ratings would vary according to children's ages. Future research should investigate the effect of age on the measures used in the DAI.

Some of the children in the NLL group had low student responsiveness and/or teaching effort scores but obtained average change scores. This would be important to keep in mind when assessing an individual child in the absence of scores for comparison children. The assessor may want to weigh the relative magnitudes of ratings versus average change in story scores after mediation when making a decision. The DAI manual provides examples of assessments with three children, two of whom were identified by the measure as capable language learners and one of whom was identified as exhibiting language-learning difficulties. It is clear from the examples provided in the manual that assessors often need to weigh the evidence obtained from the ratings to determine a child's category rather than requiring each measure to meet an absolute criterion. Given the fact that the same level of specificity could be obtained using only average change in targeted and non-targeted components in our study, it may be advisable to give more weight to these factors in identification of L-LD. However, given the small sample in this study, the findings must be replicated and cross-validated with more children and with different cultural groups before firm recommendations can be made. Since classifications of school personnel and the DAI identified the same children as having difficulties with only one exception, we assume that school personnel were skilled at identifying children who may have language problems. Imagine, however, a case in which a child from this population was referred incorrectly as possibly having language difficulties. Recall that in the present study,

children from both groups scored similarly in the initial test phase. If the child was tested using a static measure of narrative ability similar to the procedure in the test phase of the current study, it would be quite likely that the child would test similarly to children who have language difficulties whether or not the child was actually a capable language learner. The data from the teach and re-test phases would be needed to accurately distinguish the child from children with true language problems. The advantage of a dynamic technique such as that used in the DAI is the ability to examine a child's ability to learn a skill rather than the ability to assess a current skill level.

When assessing individual children, the examiner must keep in mind that a child may not meet all of the criteria for capable language learner but may still be considered one based on the overall pattern of results. In addition, if future studies find similar results to the current study, change in targeted and non-targeted components may be sufficient to classify a child as having or not having a language-learning disorder.

The fact that school personnel and DAI results agreed so well suggests that the use of referrals followed up by the DAI procedure should result in accurate identification of children with language impairment. The results of this study echo those of previous studies with other populations such as Latino-American, African-American, Arapahoe, and Shoshone (Peña et al., 1992; Ukrainetz et al., 2000). As in those studies, dynamic assessment provided information that distinguished children with identified and persistent language problems from those who needed only a brief mediation to improve their performance.

Future Directions

The DAI was successfully used in the present study to distinguish children with and without possible language learning disorders in this population. It would be important to replicate this study in more First Nations communities, both urban and rural, and with a larger sample size. Additional data could serve as a cross-validation sample to see whether the same results would be obtained for the discriminant function. Replication, cross validation, and larger samples will allow a greater understanding of the accuracy and validity of this culturally sensitive tool when used with First Nations children. In addition, information on fidelity (e.g., ease of administering the program in a standardized way) and reliability of story measures would be desirable. The present study did not examine fidelity of program administration, and stories were scored by consensus between the examiners. It would be useful to document these features of the DAI in future research.

Conclusions

This study found that Dynamic Assessment and Intervention (Miller et al., 2001) was an accurate assessment tool for children in Grade 3 on the Samson Cree Reserve in Alberta, Canada, because it was able to distinguish children with possible language-learning difficulties from those with

normal language-learning abilities. By providing evidence suggesting the utility of the DAI, this study has added support to the use of dynamic assessment to distinguish difference from disorder in First Nations children. While any single assessment tool requires the confirmation of other assessment tools to make a diagnosis, the DAI tool shows promise for use in differentiating children who may have language learning disorders from those who have normal language learning abilities.

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