Mean Length of Utterance and Use of Subordination Among First Nations School-Aged Children

Longueur moyenne des énoncés et emploi de subordonnées chez les enfants d'âge scolaire des Premières Nations

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Abstract

Many First Nations children speak a variety (i.e., dialect) of English. Grammar distinctions related to their variety may affect their Mean Length of Utterance. Also, anecdotal observations suggest that such students may use fewer subordinate clauses as a feature of their variety, further affecting their utterance length. Because utterance length and subordination rates are used along with standardized tests to determine if a child presents with a language disorder, children who speak varieties might be pathologized unnecessarily if speech-language pathologists are not aware of these differences. Also, because it is unknown how utterance length typically changes through the grades, it is difficult for educational professionals to determine whether a child is developing language as expected or needs specialized support. This study aimed to investigate the Mean Length of Utterance of and use of subordination by children who spoke a variety. Ten children in Grades 1 to 6 were asked to retell a story. As predicted, the analysis indicated that their Mean Length of Utterance was shorter than that obtained from peers who spoke more standard English, likely related to varietal differences. The analysis also indicated they used fewer subordinate clauses and that this style preference was also likely a feature of their variety. Analysis of 15 students' Mean Length of Utterance in video-tell/retell language samples showed that it increased from Kindergarten to Grade 7. This study cautions the use of Mean Length of Utterance and Subordination Index scores normed on standard English to understand the development of variety English.

Abrégé

De nombreux enfants des Premières Nations parlent une variante (c.-à-d. un dialecte) de l'anglais. Les distinctions grammaticales associées aux variantes parlées par les enfants des Premières Nations pourraient avoir un effet sur la longueur moyenne des énoncés. De plus, des observations anecdotiques suggèrent que ces élèves pourraient avoir moins souvent recours à des subordonnées, une caractéristique spécifique à leurs variantes qui affecterait d'autant plus la longueur de leurs énoncés. Puisque la longueur moyenne des énoncés et le nombre de subordonnées par phrase sont des informations complémentaires aux tests standardisés et que ces mesures sont fréquemment utilisées pour déterminer la présence d'un trouble du langage, il est possible que les enfants parlant des variantes de l'anglais se voient inutilement attribuer un trouble par des orthophonistes n'ayant pas conscience des différences entre l'anglais standard et ses variantes. De plus, comme aucune information concernant l'évolution de la longueur des énoncés d'une année scolaire à l'autre n'est disponible pour les enfants parlant une variante de l'anglais, il est difficile pour les professionnels de l'éducation de déterminer si le développement du langage d'un enfant se situe dans les limites de la normale et si un enfant a besoin d'un soutien spécialisé. La présente étude visait ainsi à examiner la longueur moyenne des énoncés et l'emploi de subordonnées chez les enfants parlant une variante de l'anglais. Il a été demandé à 10 enfants d'âge scolaire (entre la première et la sixième année) de raconter une histoire qu'on leur avait précédemment présentée par vidéo. Conformément aux prédictions, les résultats de cette analyse ont révélé que les enfants des Premières Nations avaient des longueurs moyennes des énoncés plus courtes que leurs pairs parlant un anglais plus standard, ce qui est probablement lié aux différences spécifiques de leur variante. Les résultats de cette analyse ont également indiqué que les enfants des Premières Nations employaient moins de subordonnées, suggérant que cette préférence stylistique est une caractéristique de leur variante. De plus, les longueurs moyennes des énoncés de 15 élèves ont été calculées à partir d'échantillons de discours recueillis dans une tâche où les enfants étaient invités à raconter une histoire leur ayant été précédemment présentée par vidéo. Les résultats de cette analyse ont indiqué que la longueur des énoncés augmentait de la maternelle à la 7e année. Les résultats de la présente étude invitent à faire preuve de précaution lors de l'utilisation de normes s'appuyant sur l'anglais standard pour comprendre le développement du langage des enfants parlant une variante de l'anglais à l'aide de la longueur moyenne des énoncés et du nombre de subordonnées par phrase.

Among scholars of language variation, it is broadly accepted that children who speak varieties may be at an educational disadvantage (see, for example, Fletcher, 1983, for English as spoken by "American Indians"; Gatlin & Wanzek, 2015; Labov, 1982, 2003; Rickford & Rickford, 1995, on African American language and other varieties in the United States; Malcolm, 2007, on Australian Aboriginal English). Differences in pronunciation (Labov, 2003), grammar (Siegel, 2010), and vocabulary (Charity Hudley & Mallinson, 2011) can affect literacy development (N. P. Terry et al., 2010) and learning in math and science (J. M. Terry et al., 2015). Cultural differences in the way language is used can lead to teacher and student misunderstandings and change teacher perspectives about students, which may negatively influence academic outcomes (Siegel, 2010). Teachers' lack of understanding about varieties may cause them to underestimate children's abilities (Mallinson & Charity Hudley, 2017). Moreover, the use of assessment tools designed for speakers of standard varieties can result in unnecessary pathologization and ineffective pedagogical approaches (Baugh, 2015; Crago & Westernoff, 1997).

The Mean Length of Utterance (MLU) metric is one of the tools a speech-language pathologist might use to assess language development. MLU is commonly measured by calculating an average number of morphemes or words per utterance in a language sample (Craig & Washington, 2006). Brown (1973) used morphemes as his unit of measurement when studying preschool children's morphological and syntactic development. He created age-related stages of language development, with each age and stage associated with a range of MLU. Loban (1976) used words when studying the language development of school-aged children from Grade 1 to 12. He segmented utterances into *communication units*; he defined a communication unit as an independent clause and its modifiers. Once a sample was segmented into communication units, Loban calculated the length of each utterance in words and an average mean length of communication unit for the sample. Just as Brown found that an increased MLU was associated with increased language development and age for preschoolers, Loban found that an increased mean length of communication unit was associated with increased language development, syntactic complexity, and school grade level.

MLU remains an effective measure to match peers for language complexity for research (Craig & Washington, 2006). Researchers also use MLU segmentation rules to count utterances in a standardized way. For instance, Van Hofwegen and Wolfram (2010) segmented utterances into communication units when studying children's African American language. They used the Systematic Analysis of Language Transcripts (SALT) software to do so. SALT "standardizes the process of eliciting, transcribing, and analyzing language samples. It includes a transcription editor, standard reports, and reference databases for comparison with typical peers" (SALT, 2019, About Us section, para. 1). SALT (Miller & Iglesias, 2012) segments utterances by communication unit and can calculate mean utterance length in words and morphemes. Rather than referring to these measures as mean length of communication unit in words and morphemes, SALT uses MLU in words and morphemes. SALT software was used to analyze the language samples collected for this study.

Speech-language pathologists also use MLU and mean length of communication unit for evaluation purposes because they are associated with age and grade (Brown, 1973; Loban, 1976). Speech-language pathologists might use MLU as a criterion-referenced method of assessment, along with other methods such as standardized tests, to decide whether a child's expressive language is developmentally typical (i.e., MLU or mean length of communication unit falls within a predicted age range) or is disordered (i.e., MLU or mean length of communication unit falls below the predicted age range; Miller et al., 2011). Because SALT provides comparison databases of MLU obtained from samples of typically developing children in other locations in North America, speech-language pathologists can use SALT to help them decide whether a child needs their specialized help. However, it lacks specificity and sensitivity measures regarding the accuracy with which it predicts language disorder.

Pearce and Flanagan (2019) raised concerns about using MLU as an assessment tool with students who may speak a variety. Their study of narrative language samples produced by typically developing Indigenous and non-Indigenous Australian children in their first year of school found that Indigenous students' sentence length was significantly shorter than that of non-Indigenous students. They suggested that their shorter MLU may be related, in part, to factors associated with their Australian Aboriginal English variety, such as less frequent use of subordinate clauses.

The use of MLU to assess First Nations students living in Canada may also be questionable because there is increasing consensus that many children of First Nations ancestry may also speak a variety of English (Ball & Bernhardt, 2008; Battisti et al., 2014; Epstein & Xu, 2003; Eriks-Brophy, 2014; Genee & Stigter, 2010; Hart Blundon, 2016; Heit & Blair, 1993; Kay-Raining Bird, 2014; Peltier, 2009; Sterzuk, 2011; Toohey, 1986; Wawrykow, 2011; Wiltse, 2011).

Toohey (1986) was one of the first scholars to propose the existence of First Nations English varieties. Reviewing the work of researchers of Native American Englishes, she

noted that Canadian educators also assumed that many First Nations children spoke distinct varieties of English. She cited the British Columbia's Ministry of Education's reference to "Indian English" in their "Language Arts for Native Indian Students" resource book as evidence of this assumption (Toohey, 1986, p. 134). Epstein and Xu (2003), Heit and Blair (1993), and Sterzuk (2011) listed differences in pronunciation, spelling, grammar, and discourse patterns that they observed being used by children in Saskatchewan. Peltier (2008), a First Nations speech-language pathologist, provided observations regarding what she thought were pronunciation, conceptual, and grammatical features of her Nation's variety in Northern Ontario. Genee and Stigter (2010) listed grammatical features that appeared in the writing of Blackfoot Elders and college students in Alberta. Ball and Bernhardt (2008) summarized potential morphological, syntactical, and phonological features based on anecdotal reports from participants of a First Nations English forum held in British Columbia. Wawrykow (2011) observed that many of her First Nations students on Vancouver Island in British Columbia did not often use conjunctions, which are used to form complex sentences.

Hart Blundon's (2019, 2022) research supported the anecdotal observations of Canadian scholars, namely that many First Nations children who attended a school in a small town in Northern British Columbia spoke an English variety. At least 23 grammatical features characterized their variety (see Appendix). For example, children did not always include the copula or auxiliary in their speech (e.g., "They ___ waiting"), or they did not always produce final <ed> audibly when forming past tense (e.g., "He **look** there yesterday"). Distinctions such as these could lower a student's MLU. At the same time, words not typically included in standard Canadian English might be included in their variety (e.g., use of "then here" instead of "then"). A distinction such as this would result in a higher MLU score because of the word "here."

Hart Blundon (2019, 2022) also observed that children tended to speak in single-clause sentences, or they tended to "string" single clauses together to form multiclause sentences (e.g., "And then they come out then help and sit down and have more apples") rather than use subordination and embedding (e.g., "The bull, **who helped the girl out of the water**, sat down with her and shared some apples"). Their lack of complex sentence construction appeared to be related to style preference and a feature of their variety rather than an indicator of language disorder. A tendency to avoid complex sentence constructions could also affect MLU.

Currently, there is no information regarding how children who speak First Nations English varieties develop their language. While this author's anecdotal observations suggested that MLU did increase over time, the language development of children who speak varieties has not been studied in any systematic way. Lack of information about how their language changes provides a problem for educators and educational professionals; it is difficult to determine whether a child is developing language as expected or requires specialized support.

This present study was undertaken to begin to address these gaps in knowledge. It was part of a larger exploratory study of the First Nations English variety spoken by children in a school in Northern British Columbia (Hart Blundon, 2019). In the larger study, Hart Blundon (2019, 2022) first documented the presence of at least 23 grammatical features appearing in oral narratives by retrospectively analyzing kindergarten samples collected for speech-language pathology purposes. Then, using a cohort sequential design, Hart Blundon (2019) found that children used features at high rates at school entry, lower rates in Grade 3 and 4, and increased rates as they entered middle school. Features that appeared in their oral language also appeared in their writing. The larger exploratory study concluded with an investigation of the student's MLU, their use of subordination, and the change in their MLU over grades. This latter study is the focus of this paper.

The author's questions were:

- Do school-aged children who speak a variety of English have a different MLU than those of age-matched peers who speak a more standard variety of English?

- Do these children use subordination of clauses less frequently than age-matched peers who speak a more standard variety?

- How does the children's MLU change as they advance through the grades?

Given Hart Blundon's (2019, 2022) observations, it was hypothesized that the MLU of First Nations students who spoke a variety would likely be shorter than the MLU of children who spoke a more standard variety, owing to word and morphemes omissions. It was also hypothesized that the students used fewer subordinate clauses as a feature of a variety rather than as an indicator of language disorder. Finally, it was hypothesized that children did develop their language over time.

Positioning the Researcher

When researchers study issues that affect First Nations people, they must position themselves so their biases are transparent. The author is a non-Indigenous speech-

language pathologist who was raised in a white middle-class home in New Brunswick, Canada. While never experiencing racial discrimination, the author's Maritime accent has been judged, which may explain the author's interest in varieties. Indigenous research methodology was used in this study, such as personal contact with participants' guardians and community members, rather than written communication alone. However, primarily Western methods of data collection and analysis were applied.

Method

After describing the study site and community consultation, the methods used to address the research questions are presented in the order in which data were collected in the larger study carried out by Hart Blundon (2019). Study 1 addresses the third research question and Study 2 addresses the first and second research questions.

Study Site

The study took place in a small school in Northern British Columbia. Due to potential negative stereotyping of this community's unique way of speaking English, Elders and community members requested that the school and community remain confidential. Thus, only limited information has been shared about it. The community has been fictitiously referred to as "Bigton" and the school, "Bigton School." This research received ethical approval from the University of Victoria's Human Research Ethics Board (Protocol Number 13-260).

Community Consultation

Parents, the school district, and the Bigton community were consulted regularly both by in-person contact and written documents. Two Indigenous consultants helped ensure that the project was carried out in ways that were culturally safe and respectful of local protocols. Regular presentations were made to numerous groups, including the Parent Advisory Council, Bigton School staff, the Bigton community, the Band Council, and the committee that oversees the Nation's language and culture.

Study 1: Change in MLU as Children Advance Through the Grades

To answer the research question, "How does MLU change as children advance through the grades," the oral narrative language samples collected to study the use of grammatical features over grades in the larger exploratory study (Hart Blundon, 2019) were also used to calculate MLU over grades.

Recruitment

An attempt was made to recruit 27 Bigton School children whom the author had previously identified as

English as a second dialect (British Columbia Ministry of Education, 2021) in her role as speech-language pathology consultant. The author had designated these students per British Columbia Ministry of Education guidelines that defined English as a second dialect students as those who "speak a dialect of English that differs significantly from Standard English used in school and in broader Canadian society (i.e., significant variations in oral language vocabulary and sentence structure from those used in Standard English)" (British Columbia Ministry of Education, 2021, p. 9). In British Columbia, English as a second dialect students fall under the umbrella of English language learners. Allocated funds are intended to be used by districts to acquire resources to support students who speak varieties to learn standard Canadian English. Most students designated are Indigenous.

The learning resource teacher first mailed a letter asking parents or guardians to permit the researcher to contact them about the project. This third-party approach was intended to mitigate any pressure families might feel about having their child participate, because the researcher was also speech-language pathologist consultant to the school. The school's receptionist then made reminder phone calls to families as necessary. Families of the 15 children who gave their permission to be contacted were sent a letter and follow-up phone call, if necessary, that described the project, its goals, and intentions. All families who agreed to be contacted also agreed to allow their children to participate.

Participants

Fifteen participating students were in kindergarten to Grade 5 at the onset of the 3-year study. They included six typically developing students (NOSPED) and nine students who had received speech-language pathology or special education services or designations (SPED). In British Columbia, students who are designated may fall into the following categories: physically dependent; deafblind; moderate to profound intellectual disability; physical disability or chronic health impairment; visual impairment; deaf or hard of hearing; autism spectrum disorder; intensive behaviour intervention or serious mental illness; mild intellectual disabilities; learning disabilities; moderate behaviour support or mental illness (British Columbia Ministry of Education, 2002). No students with a gifted designation participated in this study. Because the school was small with small class sizes, to protect their privacy and as agreed upon with their parents, no further details will be released concerning individual children such as their date of birth, gender, or details regarding their special education designation or the support they needed in school. SPED students were included in the analysis because they

also speak dialects (Oetting et al., 2016). Also, because some SPED students have language disorders, which are associated with shorter MLU and less use of subordination, their data were analyzed separately to investigate whether language disorder was a potential factor in their MLU and use of subordination.

Experimental Design, Data Collection, Interrater Reliability, and Statistical Analysis

A cohort sequential design was used (see **Table 1** for the number of participants and a schematic of the research design). Narrative language samples were collected in May and June each year for 3 years. Written samples were also obtained, with the task order (i.e., oral-first or written-first) being counterbalanced to control for carryover effects. Only the analysis of oral samples is presented in this paper (see Hart Blundon, 2019, for details concerning the analysis of written samples). Witnessed child assent was obtained for each sample.

Three short videos were used to obtain narrative language samples. These were *Balloons* (Kim, 2008; Year 1), *Fantasia Taurina* (Pérez González, 2009; Year 2), and *Wasabi Guy* (Ushko, 2013; Year 3). These videos were selected because they had been particularly successful in eliciting productive language samples for kindergarteners (Hart Blundon, 2019, 2022). Two school principals had vetted the videos to ensure their appropriateness for use with these school children. None of the videos featured Indigenous characters or themes. However, in the author's role as speech-language pathology consultant to the school, children indicated that they were familiar with non-Indigenous-themed YouTube videos. To mitigate any potential difficulties with unfamiliar vocabulary, students were trained on vocabulary items. A complete description of elicitation protocols is available at Hart Blundon (2019).

Each year, a different video was used to maintain student interest. Using a different video also mitigated potential practice effects that might reduce processing demands and thus enhance a child's word fluency and sentence length and complexity (see Dollaghan et al., 1990, on the language effects of familiarity of videotaped events). Varying videos also made it possible to determine whether grammatical patterns persisted in subsequent years under conditions of new vocabulary and new content. The persistence of grammatical patterns, despite changed conditions, provided evidence that observed grammar differences were features of a local variety of English (Wolfram & Adger, 1993). While videos had been viewed previously by some older participants, to the author's knowledge, none had been viewed more recently than 2.5 years before data collection. Miller et al. (2011), experts in language sample analysis, suggested that language sampling can be repeated sooner than the 6-months-to-1-year elapsed time usually recommended for standardized testing. Thus, a 2.5-year elapsed time further ensured a reduction in practice effects.

To collect oral samples, children were asked to watch a video and then tell the author and researcher the story of what had happened. Because the aim of this research was also to study the children's use of features (see Hart Blundon, 2019), including possible differences in verb tense, the children were also asked to tell the author what was happening while watching the video and to predict what would happen next. Elicitation protocols were also designed to encourage the production of other forms identified as characteristic of the local variety of English. These included the production of pronouns, articles, determiners, prepositions, plurals, possessive, negation, conjunctions, as well as differences in the way utterances were constructed.

Instructions were placed on a table to use as a reference but were not read. Instead, they were given orally to create a relaxed, fun, familiar, natural, non-test-like atmosphere. They were rephrased or broken into smaller units depending on the child's ability level and age. Additionally, in some instances, comments like, "Now we're going to do something special," or "Look at me" were included to motivate the child to continue or gain their attention. Some direct response or conversation was used to establish rapport; otherwise, comments and conversation were kept to a minimum.

Language samples were collected in a small office in the school. Students were audio-recorded using a Sony IC Recorder ICD-UX70 (recording format: MP3; sampling frequency: 44.1 kHz; bit rate: 128 kbps; microphone sensitivity set at a low level suitable for small spaces) that was held approximately 46 cm from each child's mouth.

Table 1				
Experimental Design: Number of Participants				
Grade	Year 1	Year 2	Year 3	Total
	n	*n*	*n*	
K	1			1
1	2	1		3
2	4	2	1	7
3	3	4	1	8
4	2	2	4	8
5	3	2	2	7
6		3	1	4
7			3	3
Total	15	14	12	41

Note. K = kindergarten.

After completing SALT training, the author assessed her ability to reliably code transcripts of the collected language samples with SALT conventions necessary to calculate MLU in words and morphemes by comparing her SALT-coded transcripts with those of professional transcriptionists from SALT Software. Word-by-word agreement on 2 of 15 (13.33%) transcripts collected in Year 1 was 93.35%, on 2 of 14 (14.69%) collected in Year 2 was 93.94%, and 2 of 12 (16.67%) collected in Year 3 was 94.73%. Agreement on conventions needed to calculate MLU, including utterance segmentation, applicable SALT codes, identification of complete and intelligible verbal utterances, and maze placement for Years 1, 2, and 3 was 87.85%, 88.71%, and 87.15%, respectively. Comparing the author's transcription and coding to those of SALT transcriptionists, the author was 97.64% and 98.23% accurate in calculating MLU in words and morphemes respectively for Year 1, 96.29% and 95.37% for Year 2, and 96.74% and 97.41% for Year 3. The author then used SALT scoring conventions to segment utterances and code orthographically transcribed language samples (Miller et al., 2011) and SALT to measure MLU in words and morphemes.

IBM SPSS descriptives and Microsoft Excel were used for descriptive analyses of NOSPED, SPED, and all students (i.e., NOSPED and SPED students combined). Given the small sample size, parametric tests were not used to analyze results. Neither were nonparametric assessments such as the Kruskal-Wallis assessment, which require a minimum group size of five to be valid. Instead, Monte Carlo assumption-free permutation analyses using R statistical software were used with 100,000 simulations to generate a probability distribution (p). In addition, the 95% confidence limits for the mean of the simulated differences were calculated.

To determine whether changes in the dependent variables MLU in words and morphemes between grades were statistically significant, simulations were carried out for Grades 1 and 4 and Grades 4 and 7 for the dependent variables MLU in words and morphemes. Comparisons for Grades 1 and 4 and Grades 4 and 7 were carried out because observations for Grades 1, 4, and 7 were independent, whereas observations for comparisons of other grades were not. In addition, Grade 1 can represent a mid-early elementary school grade, Grade 4 a mid-late elementary school grade, and Grade 7 a mid-middle school grade in British Columbia. Independent variables were Grade (1, 4, and 7). To assess whether there were significant differences between NOSPED and SPED groups, Monte Carlo simulations were carried out for Grade 1, 4, and 7 using R statistical software for dependent variables MLU in words and morphemes. Monte Carlo simulations could not be completed for the interaction of grade by SPED due to the presence of groups with an n of 1 with 0 degrees of freedom. Instead, Monte Carlo simulations were carried out to determine overall differences in the MLU between NOSPED and SPED students.

Study 2: Exploration of MLU and Use of Subordination

Study 2 was carried out to answer the first two research questions, "Do school-aged children who speak a variety of English have a different MLU than those of age-matched peers who speak a more standard variety of English?" and "Do children who speak a variety of English use subordination of clauses less frequently than age-matched peers who speak a more standard variety?"

Participants

Ten children were randomly selected from the pool of 15 students who participated in Study 1. Only 10 students were selected to participate in this study to ease the demands on the other five students and still gather enough data to discuss trends. Data for one SPED student of the 10 participating students were removed from the analysis because the student's scores were more than 3.29 SD from students' mean score in the comparison group (Tabachnick & Fidell, 2014). Five participants were NOSPED students, and four were SPED students. Samples were collected in Year 2 of the cohort sequential study.

Data Collection

Students were asked to complete SALT's narrative story retell task (Miller et al., 2011, pp. 197–204). The narrative story retell task was selected because SALT provided a Subordination Index score and comparison groups for all participating students. A Canadian source, the Edmonton Narrative Norms Instrument (ENNI; Schneider, Dubé, & Hayward, 2005) was considered because it provided comparison groups for special education students. It was not selected because it did not provide normative data for the older participants in this study or information on the rate of use of subordination (Miller et al., 2011). In SALT's narrative story retell task, the child listens to a story and then retells it while looking at illustrations in a version of the storybook that does not contain text. This particular elicitation protocol was selected for this study because comparison groups for all participants' grades are provided in the SALT database. Protocols were followed as outlined in Miller et al. (2011). For kindergarten and Grade 1 students, the author followed administrative procedures outlined in Option 1 and used a script rather than an audiotape of the story. Miller et al. (2011) stated, "There are three options for eliciting the samples. Use whatever option you prefer as they all elicit similar narratives" (p. 198). As in Study 1, language samples were collected in a small office in the school. Samples for

Study 2 were collected in the spring of Year 2 of the cohort sequential study, using the same recording techniques.

Interrater Reliability and Statistical Analysis of MLU

The author assessed her ability to reliably code transcripts with SALT conventions needed to calculate an MLU in words and morphemes by comparing her SALT-coded transcripts with those of professional transcriptionists from SALT Software (Miller & Iglesias, 2012). Word-by-word agreement on 1 of 10 (10%) transcripts was 91.47%. Agreement on conventions needed to calculate MLU, including utterance segmentation, relevant SALT codes, identification of complete and intelligible verbal utterances, and maze placement on 1 of 10 (10%) transcripts was 91.49%. Comparing the author's transcription and coding to SALT transcriptionists, the author was 97.66% and 97.70% accurate in calculating MLU in words and morphemes, respectively.

Upon completing reliability assessment, SALT computer software was used to calculate MLU in words and morphemes for each participant. Then, replicating a procedure that a speech-language pathologist might carry out to help determine whether a student needed specialized support, the standard deviation of each participant's result from the MLU of age-matched peers in SALT comparison groups was determined. Comparison groups were comprised of "English-fluent" (Miller et al., 2011, p. 197) age-matched (+/- 6 months) students from Wisconsin and California. Students from Wisconsin came from homes representing a range of socioeconomic statuses. They were typically developing as measured by their expected progress in school and absence of special education services. Students in California were of average ability as per their performance in class and on standardized tests and their non-use of special education services. They were balanced for "race, ethnicity, gender, and socioeconomic status" (Miller et al., 2011, p. 198). Monte Carlo simulations were then used to determine whether there were differences between NOSPED and SPED students' standard deviations from the mean of their comparison groups.

Interrater Reliability and Statistical Analysis of Use of Subordination

SALT's Subordination Index scoring system was also applied to utterances in nine story retell language samples. The Subordination Index produces a ratio of the total number of clauses to the total number of communication units (Miller et al., 2011). The author subsequently assessed her ability to reliably determine Subordination Index scores by comparing her transcripts with those of transcriptionists from SALT Software. There was 100% agreement on 1 of 9 (11%) transcripts. After completion of interrater reliability

assessment, SALT computer software was used to calculate each participant's Subordination Index score. Then, the standard deviation of each participant's result from the Subordination Index scores of age-matched peers was determined. Monte Carlo simulations were used to determine whether there were differences between NOSPED and SPED students' standard deviations from the mean of comparison groups.

Results

Study 1: Change in MLU as Children Advance Through the Grades

Table 2 shows the mean, standard deviation, and sample size of MLU words and morphemes for Grades for NOSPED, SPED, and all students. **Figures 1** and **2** illustrate these data graphically. **Table 2** and **Figures 1** and **2** show that MLU in words and morphemes declined for all students from kindergarten to Grade 1. There appeared to be a levelling in MLU in words and morphemes between Grades 1 and 2, and then an increase from Grade 2 to Grade 5. Between Grades 5 and 6, there was a slight decrease in MLU in words but a levelling in MLU in morphemes. A jump in MLU in words and morphemes occurred between Grades 6 and 7. As for NOSPED and SPED students, the MLU in both words and morphemes of NOSPED students appeared to be longer than the MLU of SPED students from Grade 1 to 3. From Grade 3 to 5, the two groups merged. Then, from Grade 4 to 7, the MLU of SPED students surpassed the MLU of NOSPED students.

Monte Carlo analysis found that the null hypothesis that the observed difference of 0.62 between the means of all students in Grades 1 and 4 for MLU in words could be produced by chance alone was accepted (p = .33), with a simulated mean of 0.49 with 95% confidence interval (CI; [0.03; 1.24]). That is to say, the MLU in words of all students in Grade 1 and Grade 4 was likely not different. Similarly, for MLU in morphemes, the null hypothesis that the observed difference of 0.63 between the means of all students for Grades 1 and 4 could be produced by chance alone was accepted (p = .34), with a simulated mean of 0.52 with 95% CI [0.02; 1.31]. In other words, the MLU in morphemes of all students in Grades 1 and 4 was likely not different. However, for the difference between Grades 4 and 7, Monte Carlo analysis found that the null hypothesis that the observed difference of 2.07 between the means of all students for MLU in words for Grades 4 and 7 could be produced by chance alone was rejected (p = .02), with a simulated mean of 0.74 with 95% CI [0.01; 1.88]. In other words, the MLU in words of all students in Grades 4 and 7 was likely different. Similarly, for MLU in morphemes, the null hypothesis that the observed difference of 2.60 between
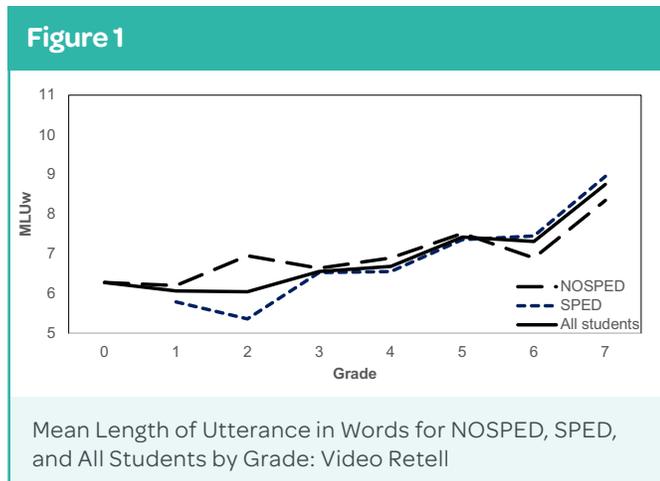
Table 2

Descriptive Statistics for NOSPED, SPED, and All Students: Video Retell

Group	MLUw	*SD*w	MLUm	*SD*m	*n*
Grade K					
NOSPED	6.28		7.16		1
SPED					
All students	6.28		7.16		1
Grade 1					
NOSPED	6.21	0.19	7.01	0.25	2
SPED	5.79		6.70		1
All students	6.07	0.28	6.91	0.25	3
Grade 2					
NOSPED	6.96	0.55	7.90	0.37	3
SPED	5.37	0.48	6.18	0.59	4
All students	6.05	0.97	6.92	1.03	7
Grade 3					
NOSPED	6.64	1.15	7.36	1.26	2
SPED	6.53	0.94	7.42	0.91	6
All students	6.56	0.91	7.40	0.91	8
Grade 4					
NOSPED	6.90	0.33	7.77	0.28	3
SPED	6.56	1.28	7.40	1.36	5
All students	6.69	1.00	7.54	1.06	8
Grade 5					
NOSPED	7.52	1.23	8.48	1.23	3
SPED	7.36	1.45	8.33	1.52	4
All students	7.43	1.25	8.39	1.29	7
Grade 6					
NOSPED	6.90		7.78		1
SPED	7.45	1.20	8.59	1.63	3
All students	7.31	1.02	8.39	1.39	4
Grade 7					
NOSPED	8.35		9.84		1
SPED	8.96	1.21	10.30	1.10	2
All students	8.75	0.92	10.14	0.82	3

Note. NOSPED = typically developing students; SPED = students who required speech-language pathology and/or special education support; All students = total NOSPED and SPED students combined; K = kindergarten; MLUw = mean length of utterance in words; MLUm = mean length of utterance in morphemes.
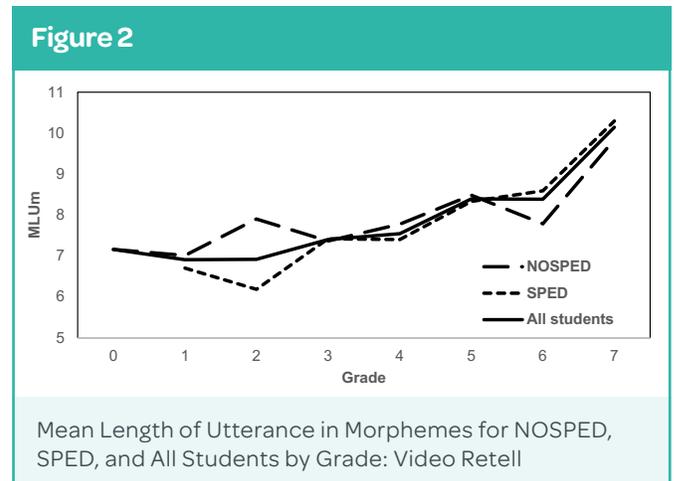
the means of all students for Grades 4 and 7 could be produced by chance alone was rejected (*p* = .01), with a simulated mean of 0.85 with 95% CI [0.03; 2.11]. In other words, the MLU in morphemes of all students in Grades 4 and 7 was likely different.

Monte Carlo analysis showed that the null hypothesis that the observed difference of 0.15 between the means of NOSPED and SPED for MLU in words could be produced by chance alone was accepted (*p* = .84), with a simulated mean of 0.57 with 95% CI [0.02; 1.47]; the MLU in words of the NOSPED and SPED groups was likely not different. The null hypothesis that the observed difference of 0.17 between the means of NOSPED and SPED for MLU in morphemes could be produced by chance alone was accepted (*p* = .84), with a simulated mean of 0.65 with 95%

Figure 1

Mean Length of Utterance in Words for NOSPED, SPED, and All Students by Grade: Video Retell

Note. MLUw = mean length of utterance in words; NOSPED = typically developing students; SPED = students with history of special education or speech-language pathology support; All students = total NOSPED and SPED students.

Figure 2

Mean Length of Utterance in Morphemes for NOSPED, SPED, and All Students by Grade: Video Retell

Note. MLUm = mean length of utterance in morphemes; NOSPED = typically developing students; SPED = students with history of special education or speech-language pathology support; All students = total NOSPED and SPED students.

CI [0.03; 1.71]; the MLU in morphemes of the NOSPED and SPED groups was likely not different.

In summary, the MLU for all students in Grades 1 and 4 was likely the same, whereas the MLU for all students in Grades 4 and 7 was likely different. As for the behaviour of NOSPED and SPED students, descriptive analysis indicated that in the early grades, the MLU of NOSPED students exceeded the MLU of SPED students. In Grade 4, the two groups performed similarly, but by Grade 7, the MLU of the SPED students appeared to surpass the MLU of the NOSPED students. Overall, there was likely no difference between the NOSPED and SPED students.

Study 2: Exploration of MLU and Use of Subordination

Table 3 shows individual NOSPED (*n* = 5) and SPED (*n* = 4) students' MLU in words and morphemes on the story retell task, the mean and standard deviation of the SALT database comparison group, each participant's standard deviation from the SALT database comparison group for both words and morphemes, and the n of the SALT comparison group. From an examination of **Table 3**, of the remaining nine participating students, the standard deviation of participating students' MLU in words compared to SALT's database of typically developing English-speaking students ranged from −0.39 to −2.43. The standard deviation of students' MLU in morphemes ranged from −0.32 to −2.26. In summary, all participating children's standard deviations of their MLU in words and morphemes were negatively skewed compared to the MLU's of age-matched peers in SALT's databases. This was the case regardless of whether students had a history of receiving speech-language pathology or special education services or not.

A Monte Carlo analysis showed that the null hypothesis that the observed difference of 0.30 between the average standard deviation from the mean of comparison groups of NOSPED and SPED students' MLU in words could be produced by chance alone was accepted (*p* = .55), with a simulated mean of 0.38 with 95% CI [0.02; 1.01]. That is to say, the mean standard deviation of the MLU in words of the NOSPED and SPED groups was likely not different. Similarly, the null hypothesis that the observed difference of 0.27 between the average standard deviation from the mean of comparison groups of NOSPED and SPED students' MLU in morphemes could be produced by chance alone was also accepted (*p* = .60), with a simulated mean of 0.36 with 95% CI [0.03; 0.95]. That is to say, the standard deviation of MLU in morphemes of the NOSPED and SPED groups was likely not different. In summary, contrary to what might be expected, the negatively skewed results obtained by the typically developing students were like the SPED students' results.

Table 4 shows individual participant's SALT Subordination Index scores; the mean, standard deviation, and n of the SALT database comparison group; and each participant's standard deviation from the mean of the SALT comparison group for NOSPED students (*n* = 5) and SPED students (*n* = 4). **Table 4** shows that 33% (3 of 9) of students' Subordination Index scores were more than 1 standard deviation below the mean of age-matched peers in SALT comparison groups. Twenty-two percent (2 of 9) students obtained scores above the mean, while the remaining 78% (7 of 9) obtained scores below the mean. Thus, most scores appeared to be negatively skewed compared to the scores obtained by fluent speakers of mainstream American English in SALT comparison groups. This was the case for all students, including those with no history of receiving special education services.

Table 3

Individual Students' MLUs and Standard Deviations From Comparison Group Means; Comparison Group Means, Standard Deviations, and Sizes: Story Retell

MLUw	Mean (*SD*) of CG	*SD* from CG	MLUm	Mean (*SD*) of CG	*SD* from CG	CG *n*
Group NOSPED						
7.35**	10.32 (1.45)	−2.05	8.14**	11.29 (1.57)	−2.01	83
7.26**	10.59 (1.54)	−2.17	7.85**	11.63 (1.68)	−2.26	37
9.19	9.72 (1.38)	−0.39	10.09	10.56 (1.49)	−0.32	46
7.24*	8.24 (0.96)	−1.04	8.04*	9.26 (1.08)	−1.13	82
6.68	7.66 (1.22)	−0.80	7.23	8.42 (1.36)	−0.88	58
Group SPED						
8.84	10.27 (1.46)	−0.98	9.60*	11.25 (1.60)	−1.04	91
7.85*	10.30 (1.47)	−1.66	8.63*	11.28 (1.61)	−1.65	88
5.72*	7.19 (1.14)	−1.29	6.40*	8.23 (1.29)	−1.42	24
6.17**	8.37 (0.90)	−2.43	7.10**	9.42 (1.02)	−2.26	50

Note. NOSPED = typically developing students; SPED = students who required speech-language pathology and/or special education support; MLUw = mean length of utterance in words; MLUm = mean length of utterance in morphemes; CG = comparison group data from Systematic Analysis of Language Transcripts database using selection criteria of ± 6 months.
* At least 1 SD from CG mean. ** 2 *SD* or greater from CG mean.

A Monte Carlo analysis showed that the null hypothesis that the observed difference of 0.41 between the average standard deviation from the mean of comparison groups of NOSPED and SPED students' Subordination Index scores could be produced by chance alone was accepted (*p* = .40), with a simulated mean of 0.40 with 95% CI [0.01; 1.05]. That is to say, the mean standard deviation of the Subordination Index score of the NOSPED and SPED groups was likely not different.

These results suggest that students appeared to speak in sentences that contained fewer subordinate clauses than those of mainstream fluent speakers of English who live elsewhere in North America. Their less frequent use

of clauses is likely not an indicator of language disorder. In fact, typically developing children used fewer subordinate clauses (mean standard deviation = −0.77) than the SPED students (mean standard deviation= −0.36) compared to age-matched peers in the SALT comparison groups.

When comparing **Table 3** to **Table 4**, sentence complexity as measured by a Subordination Index score was not as negatively discrepant as sentence complexity measured by MLU in words and morphemes compared to SALT's comparison groups. The explanation for the difference likely lies in the way the two metrics are calculated. The Subordination Index measures the use of subordination, and MLU considers both the use of subordination and

Table 4

Individual Students' Subordination Index Scores and Standard Deviations From Comparison Group Means; Comparison Group Means, Standard Deviations, and Sizes: Story Retell

SI	Mean (*SD*) CG	*SD* from CG	CG *n*
Group NOSPED			
1.27*	1.51 (0.15)	−1.56	83
1.29*	1.53 (0.20)	−1.20	37
1.35	1.43 (0.12)	−0.64	46
1.29	1.27 (0.12)	0.18	82
1.07	1.14 (0.10)	−0.62	58
Group SPED			
1.59	1.51 (0.16)	0.52	91
1.50	1.51 (0.16)	−0.08	88
1.20	1.24 (0.11)	−0.35	24
1.12*	1.30 (0.12)	−1.52	50

Note. SI = Subordination Index score; SALT = Systematic Analysis of Language Transcripts; CG = comparison group from SALT database using selection criteria of ± 6 months. NOSPED = typically developing students; SPED = students who required speech-language pathology and/or special education support;
* At least 1 *SD* from CG mean.

the number of words used in grammatical structures. Participating school children used less subordination and fewer words in their grammatical constructions. Therefore, it stands to reason that their MLU would be more negatively discrepant than their Subordination Index scores.

In summary, participating students appeared to use fewer sentences with subordination in their utterances than are used by age-matched fluent speakers of mainstream American English. Their MLU was even more discrepant than the MLU obtained by age-matched peers who are fluent speakers of mainstream American English in comparison groups. They use fewer words and fewer clauses with subordination, owing to their different English grammar and way of constructing sentences; MLU measures both factors. This was the case regardless of whether students had a history of receiving speech-language pathology or special education services or not.

Discussion

This investigation of the MLU of students who speak a First Nations English variety suggests that they spoke in shorter utterances than the MLU obtained by age-matched peers when retelling stories. This result supports the hypothesis that students who speak varieties speak in sentences different from fluent speakers of mainstream English. It also corroborates Pearce and Flanagan's (2019) results. They found that Indigenous children in Australia demonstrated a shorter MLU than students who spoke standard Australian English. Differences in the MLU shown by students who participated in this study and English speaking students from

elsewhere in North America may be due at least in part to grammar differences between their variety of English and the standard English variety (e.g., the copula or auxiliary was not always included in their speech [e.g., "They ___ waitin'."], final <ed> was not always included when forming past tense [e.g., "He look there yesterday."], and so on).

Additionally, the Subordination Index scores of students appeared to be lower than scores obtained by age-matched mainstream English-speaking peers in the United States, indicating that they used subordination less frequently. This result supports the hypothesis that students who speak varieties use subordinate clauses less frequently than speakers of more standard English. This result is also like that obtained by Pearce and Flanagan (2019). They found that Indigenous Australian students tended to use subordinate clauses less frequently, which they felt contributed to students' shorter sentence length.

Both MLU and Subordination Index scores are measurements of standard English syntactic complexity (Loban, 1976; Miller et al., 2011). Failure to acquire standard English grammar and complex utterance construction has been considered an indicator of language disorder (Miller et al., 2011). However, this may not be the case for students who speak a variety in this school, and it may not be the case for other students who speak other varieties. Instead, their MLU may be shorter due to their different English grammar. Also, their frequent use of simple sentences without subordination may be a stylistic feature of a local variety, reflective of the speakers' laconic way of speaking, and not symptomatic of language disorder.

As for the students' language behaviour as related to their special education status, in the early grades, the MLU of NOSPED students appeared to exceed the MLU obtained by SPED students on the video retell task. This is not surprising given that a shorter MLU is associated with language disorder; at least some SPED students may have had difficulty expressing themselves. However, language disorder may not be the only explanation for this result. In a study of children's use of grammatical varietal features over grades, Hart Blundon (2019) found that SPED students used features at higher rates than NOSPED students. Because the use of grammatical features may be associated with fewer English words and morphemes, the shorter MLU produced by SPED students may be related to their increased use of grammatical features. As for the students' performance relative to age-matched peers, contrary to what might be expected, there were no statistically significant differences between the groups regarding their MLU or rate of use of subordination. This suggests that there is another explanation for the typical students' performance. It is suggested that they spoke in shorter sentences and used fewer subordinate clauses than age-matched peers who spoke a more standard variety because that is typical for their community variety.

Given the results of this study, it is suggested that speech-language pathologists and other educational professionals avoid using MLU and Subordination Index scores when trying to determine whether students who speak varieties need specialized support. Until assessment tools are developed that are normed on each English variety in Canada, it is suggested that speech-language pathologists avoid all assessments not standardized on the local population.

In the meantime, however, speech-language pathologists and educational professionals must not underdiagnose. A test-intervene-test type dynamic assessment may be a best practice at present. That is, first carrying out an assessment, then providing evidenced-based respectful interventions such as recasting or contrastive analysis, and then reevaluating to determine whether the interventions have been at least introductorily successful. Recasting involves rephrasing the child's utterances without correction. It is an effective approach with children who speak varieties in the United States (Edwards & Rosin, 2016) and has been recommended for use among First Nations children (Larre, 2009). Contrastive analysis and code-switching are also effective approaches (Edwards & Rosin, 2016; Wheeler & Swords, 2004). For contrastive analysis, the educator systematically teaches the points of contrast between the two varieties. Code-switching involves teaching the student to "choose the language variety appropriate to the time,

place, audience, and communicative purpose" (Wheeler & Swords, 2004, p. 471).

Another approach may be the use of linguistically unbiased tests that do not rely on prior knowledge. Instead, they "explore children's ability to conduct psycholinguistic processing operations that are minimally dependent on prior knowledge or experience" (Campbell et al., 1997, para. 3). Bias has been reduced in nonword repetition tasks that require the child to repeat nonsense syllables. Bias has also been reduced in token tests. They require a student to perform commands using coloured geometric objects of different sizes.

Even though students in this community who spoke a variety of English appeared to speak in utterances shorter than those of age-matched peers or tended not to subordinate clauses in their utterances, their sentence length increased as they progressed through the grades. This was also the case for speakers of African American language (Craig & Washington, 2006), with older students using longer sentences. Because MLU is a measure of language development, it follows that the language of variety-speaking students who attended Bigton School in British Columbia also developed over time, albeit in a way that may be unique to their community variety. More research should be carried out to develop community-based norms for other children who speak varieties.

Limitations

Language samples were collected by a standard English-speaking adult, which may have influenced the way the students spoke English and their resultant sentence length. Because the samples were collected in just one context, no comment can be made on the students' language behaviour in other contexts, such as when they participate in community gatherings or interact with their family or peers, other than to make comments derived from anecdotal observations. Future research should focus on studying children's MLU and use of subordination in conversational and expository speech in a wider variety of contexts with a broader variety of communicative partners.

To explore the relationship between Bigton students' MLU and use of subordination compared to their age-matched peers who spoke more standard English, a story retell sample was collected in addition to an oral and written video retell sample. This third sample needed to be collected within a 2-to-3-day period. Because story retell was the third sample collected, fatigue may have influenced the results. However, when questioned, many students indicated that they enjoyed the story retell task. It was novel in that they had not completed this type of protocol before, which may have increased their motivation and counteracted fatigue.

As discussed in the Methods, Study 1, Participants section, SPED students' data were included in this analysis. Some SPED students may have presented with language disorder, and language disorder is associated with shorter MLU and less use of subordinate clauses. Determining whether their shorter MLU is related to language disorder or their English variety's grammar can be difficult. Their data were included because SPED students also speak varieties (Oetting et al., 2016). More importantly, their data were included to support the argument that typically developing students speak a variety. Statistical analysis indicated no overall difference in the MLU or rate of use of subordination for NOSPED and SPED students, nor was there an overall significant difference in their MLU over grades. Because typically developing NOSPED students behaved similarly to SPED students, another factor may have caused the NOSPED students' lowered MLU and reduced use of subordination. That factor is likely variety.

Another limitation concerns generalizability. Even though over half of the eligible students in Bigton School were recruited, absolute statements cannot be made about the language behaviour of other First Nations students in British Columbia and Canada based on data collected from 15 students. However, the results obtained in this study are like those obtained by Pearce and Flanagan (2019). They also found that Indigenous children in Australia who may speak English differently have a shorter MLU than non-Indigenous children. Therefore, it is argued that there is enough overlap that, at the very least, speech-language pathologists and educators should have a heightened awareness of the need to avoid using MLU and Subordination Index norms not standardized on their local populations of First Nations students. The issue of generalizability also speaks to the need for more research. It is hoped that this work inspires others to investigate whether varieties are being spoken in other communities and explore the MLU and use of subordination by its speakers.

Summary

This study showed that children in this community who spoke a variety of English produced utterances with a shorter MLU and fewer subordinate clauses than peers who spoke a more standard English variety, likely related to their different way of speaking English. Despite these differences, their expressive language developed over time. If educational professionals such as speech-language pathologists are not aware of these differences, they are at risk of incorrectly concluding that the variety-speaking child may have a language disorder. Additionally, if educational professionals are not aware of how the language of students who speak varieties develops over

time, they cannot know if a student is developing language as expected or needs specialized support. It is critically important that we learn more about First Nations Englishes to cease pathologizing students for their way of speaking English and, instead, celebrate their variety as a linguistic marker of their community.

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Author's Note

Acknowledgements

Disclosures

No conflicts of interest, financial or otherwise, are declared by the author.

Appendix

Grammatical Features of First Nations School-Aged Children

Feature type	Examples
Verbs	Present for past: *He **look** there yesterday; Then this kid **comes** over and looked like she was coming from a party*
	Absent copula or auxiliary: *They __ waitin'*
	Regularization: *She **blowed** the balloon; She **poppeded** the balloon*
	Absent 3rd person singular <s>: *He **kick** the ball*
	Absent -ing: *The girl is **bounce** all over*
	Absent "to": *She was waiting for the girl __ come back*
	Subject–verb agreement: *They **was** coming*
	Gots/has: *The woman **gots** a …*
Pronouns	Undifferentiated pronoun case: ***Her** blew that to him*
	Absent 3rd person singular gender distinction: ***He** (referring to a female) catches it*
Articles, determiners	Use of "that" for "the": *He got in **that** lake*
	Pronoun/determiner; absent determiner: ***Them** bees are going to get him; Then __ bull breathe in her face*
	Indefinite article: *He gots **a** glasses; **a** apple tree; The girl is tryin' get _ apple*
Prepositions	Different or absent use of preposition: *The girl got **along/out of** the way*
Non-verb-related morphology	Absent possession: *The **bull** horns are stuck in the tree*
	Absent plural: *The **bee** are gonna come out*
	Negation: *I **not** know; Now they're **ain't**; He **never** took his nose; He **don't** want him to see*
Conjunctions	Use of "and here" or "then here" for "and then":
	***Then here** he is bouncing all over; **And here** the bus came*
Utterance-level features	Absent phrase: *___ waiting for her to come (the auxiliary is also absent in this example)*
	String: *And then they come out, then help, sit down, and have more apples*
	Topicalization: *That bull, he was mad*
	Repetition: *He got really mad and really, really mad; They were jumping out and jumping back in and jumping out and jumping back in and jumping out*
	Different word order: *That you see she have a balloon*