

The Chisasibi Child Language Acquisition Study (CCLAS): A Progress Report

JULIE BRITTAIN, CARRIE DYCK, YVAN ROSE & MARGUERITE MACKENZIE
Memorial University of Newfoundland

The Chisasibi Child Language Acquisition Study (CCLAS) is a longitudinal naturalistic first language (L1) acquisition study of Northern East (NE) Cree speaking children located in the community of Chisasibi, Quebec (on the east coast of James Bay).¹ The study focuses on production only. The children participating in the study are filmed at approximately two to three week intervals, with each filming session lasting, on average, 45 minutes. In most cases, filming will cover a 30-month period, between November 2004 and May 2007. At the time of writing there are seven children in the study, four in a younger age cohort and three in the older cohort.² Our aim in this paper is to provide an overview of the progress we have made in this study, which has now entered its third year, and to provide some sense of the challenges encountered and the solutions we came up with in response. We describe the procedures we developed, in many cases through trial and error, in order to create an efficient way to conduct a longitudinal acquisition study, where researchers are not actually on site for much of the time. Our aim in this paper is to provide a “how-to” guide for other researchers/communities wishing to undertake comparable research.

At the outset we wish to thank the CCLAS families in Chisasibi for their generous participation in this study – in a very real sense they have opened their homes to us, for no other reason than to play a role in supporting the vitality of their language.

WHY CREE? WHY NOW?

In 2003 we began to feel that, collectively, we had the expertise to undertake a naturalistic L1 study of a dialect of the Cree-Montagnais-Naskapi (CMN) language complex. A number of factors seemed to have conspired to suggest that the time was right for a piece of research of this type. Speaking from a scholarly perspective, it was evident that still too few of the facts concerning L1 acquisition come from the study of the acquisition process in languages

¹ Principal funding for this research is provided by the Social Sciences and Humanities Research Council (SSHRC) of Canada (Standard Research Grant #410-2004-1836, *Phonological and morphosyntactic development in a polysynthetic language: The acquisition of Cree as a first language*) awarded to Brittain, Dyck, Rose and MacKenzie in 2004). Additional funding is provided by the Cree School Board. The project web site is located at <http://arts-srv.arts.mun.ca/cclas>.

² The age cohorts are described shortly.

typologically like Algonquian.³ For Algonquian, the language development of several children acquiring Oji-Cree as an L1 was recorded in an Ontario Ministry of Education study (Upper and McKay 1987a,b, 1988; Upper 1993). While this study was pioneering and has yielded valuable data, we were interested in a study which exploited recent developments in technology.⁴ In particular we aimed to have accurate phonological recording of the data, allowing for research in phonetic and phonological development of child language for speakers of Cree.⁵ At the time we were considering our project, in the fall of 2003, to the best of our knowledge no substantive L1 acquisition study had been made of an Algonquian language.

For polysynthetic languages in general, there is a larger body of work. There is a substantial amount of L1 acquisition research for Inuktitut (e.g., Allen 1996, 2000; Fortescue and Olsen 1992; Parkinson 2000; Crago and Allen 2001; Swift and Allen 2002), and a small number of other polysynthetic languages have been studied from an acquisition perspective, but in each case a relatively small body of data was recorded (Pye 1983, 2001 [Mayan]; Mithun 1989 [Mohawk]; Saville-Troike 1996 [Navajo]; Brown 1998, 2000 [Tzeltal]; Courtney and Saville-Troike 2002 [Navajo and Quechua]). In general, however, only a minority of L1 acquisition studies take a polysynthetic language as their focus.

There were other reasons why we felt the time was right for our study. In many of the communities in Quebec and Labrador that we were associated with and traveled to, there was increasing discussion of a number of issues having to do with children and language (such as, for example, the (de)merits of giving the Aboriginal language a central role in the schools), issues which could not properly be discussed without access to the kinds of facts that would emerge from a rigorous study of the acquisition process for any one of the CMN dialects spoken in the region. From Aboriginal community members and from non-Aboriginal (and generally non-Aboriginal language-speaking) professionals working in Speech Language Pathology (SLP), one would hear anecdotal reports that a higher incidence of Aboriginal children (as compared to their non-Aboriginal peers) required remedial help for problems referred to generally as “language delay.” These reports were based on diagnoses made by professionals who did not themselves

³ For convenience we refer to these as “polysynthetic,” setting aside discussion of precisely what characteristics a language should display in order to qualify for membership in the polysynthetic club.

⁴ We refer here, for example, to software that facilitates organizing (and analyzing) L1 data, such as *Phon* (to be discussed shortly) and *CLAN* (<http://childes.psy.cmu.edu/clan>). CHILDES (<http://childes.psy.cmu.edu>) allows on-line access to L1 data and provides tools for data analysis.

⁵ The Oji-Cree study consisted of audio recordings from which orthographic transcriptions were made.

speak the Aboriginal language, and, moreover, whose only diagnostic strategies involved testing the children in their *second* language (English or French). Commonly, in minority language situations, unrealistic expectations are placed on the education system, such that teachers and administrators are expected to be guardians of the language (Crystal 2000). Consequently, where the Aboriginal language has a presence in the school system, either as the sole language of instruction in an immersion program or as one component of a bilingual program, “poor teaching” and/or an “inadequate” curriculum are often unjustifiably targeted as the cause of the children’s (perceived) problems with language; in the absence of facts derived from substantive research, these are clearly easy targets.

We began to ask, echoing many community members’ own thoughts, “But who is to say what ‘normal’ linguistic development looks like for Cree, or for Innu-aimun or Naskapi, when there are no benchmark studies to provide this information?” Clearly, what is required is baseline data detailing the milestones of typical linguistic development for Cree speakers.⁶ Any accurate SLP diagnoses should ideally be made using these data, rather than judging Cree-speaking children on their second language performance. Thus, in addition to wanting to undertake an L1 study of Cree in order to contribute to the field of linguistics, we felt that we would be making an important contribution to the speech communities if we could provide baseline documentation of the acquisition of Cree. Such baseline data would provide speakers with the information required in order to make choices vis-à-vis the role of the Aboriginal language, in the educational system and, more generally, in the community.

Of the several communities in Quebec and Labrador that might have hosted an L1 acquisition study, we were of the opinion that Chisasibi could provide the optimal conditions for assuring the success of the study. Our colleague Marguerite MacKenzie already had a working relationship with the community stretching back some 30 years. Her knowledge of the East Cree dialect has also been an essential aspect of the project. In terms of infrastructure, the Cree School Board in Chisasibi generously offered our project office space and has made financial

⁶ Cree is by a large margin the most widely-spoken Aboriginal language in Canada, with one in ten (76,475) Aboriginal Canadians reporting it as their first language (Statistics Canada 1996). Additionally, many schools are Cree-medium (e.g., all nine of the schools which fall under the jurisdiction of the Cree School Board of Quebec). There is thus a good case to be made that such data should be made available to the Cree community in as timely a fashion as possible.

contributions to the research as well.⁷ They also have a pool of talented Cree language consultants whose knowledge of the structure of the language make them invaluable consultants to our project, as we proceed with the task of transcribing and translating the movies.

CCLAS operates in two locations, a *modus operandi* made possible by the existence of the internet. Our most basic requirement was for a high speed internet connection – this was offered to us by the Cree School Board in Chisasibi. Along with this, we required on-site technical support for occasional trouble-shooting, especially in the early days when we were setting things up. This has also been generously provided to us by the Cree School Board.⁸ The Chisasibi community of approximately 4,000 is predominantly Cree-speaking; crucially, Cree is still acquired as an L1 in Chisasibi. The school system offers Cree-language medium education from Kindergarten through Grade 3 through the *Cree as a Language of Instruction Program* (CLIP).⁹ Additionally, the Anjabowa Childcare Centre where a number of the children in the study are filmed is Cree-medium. Finally, the fact that Chisasibi has a relatively large population ensures that the privacy of participants in the study is not difficult to protect (as it might otherwise have been in a smaller community).

THE STUDY

We recruited two cohorts of children, Cohort A who were approximately 20 months old at the start of filming, and Cohort B who were a few months shy of their fourth birthday (around 42-44 months old). In this way, as Figure 1 below shows, with just 30 months of filming we will have been able to chart all the major language learning years (from approximately 1.5 to 6.5 years of age).

⁷ The same year the James Bay Cree signed the James Bay and Northern Quebec Agreement (1975), they assumed control over their education system, establishing the Cree School Board which has jurisdiction over nine Cree communities, including Chisasibi. For further information see <http://www.cscree.qc.ca>.

⁸ CCLAS thanks Paul Washipabano of the Cree School Board for his technical assistance to the project.

⁹ For an overview of CLIP, see Burnaby and MacKenzie (2001) and Burnaby, MacKenzie and Bobbish-Salt (1991).

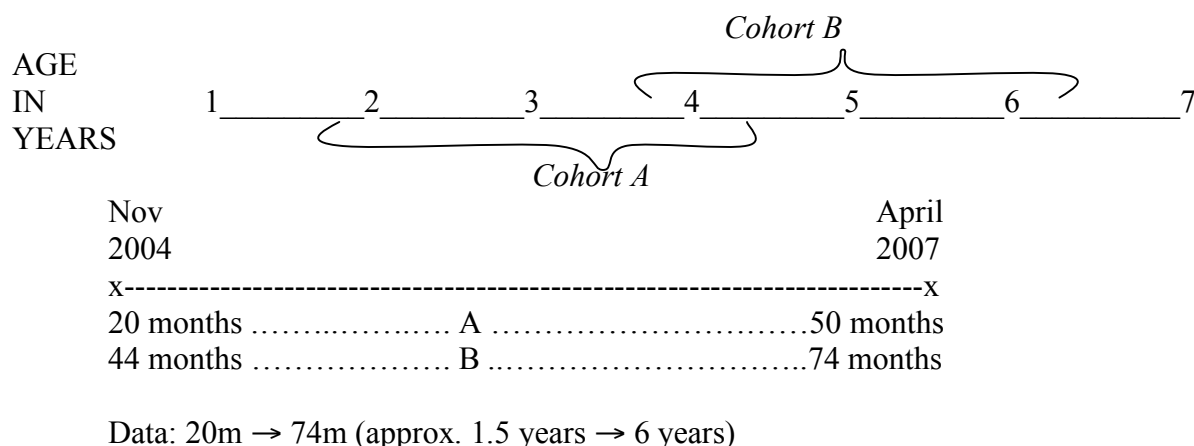


Figure 1. Filming timeline for Cohorts A and B.

Our agreement with the families includes a strict policy on privacy, ensuring that no video clips of children in the study are made public in any form. Among the research team, children are referred to by number only. While the raw data produced by the project is eventually destined to be released to a public domain via CHILDES (<http://childes.psy.cmu.edu>), this will not include any actual video material collected by the project, but it will include transcripts of the movies.

To date (December 2006), the project has cost approximately \$130,000. After a fairly modest outlay on hardware, software and other essential equipment (to be detailed shortly), most of our expenditure is accounted for by human resources: the project employs an on-site (Cree-speaking) project manager on a part-time basis (Darlene Bearskin), and a number of Linguistics students, both at the undergraduate and at the graduate level, are employed by the project at Memorial University. The duties of project employees are discussed shortly. Our other fairly significant expenditure (approximately \$10,000 per year) is travel between St John's and Chisasibi. Several visits per year are made to Chisasibi by the research team, and our project manager has visited Memorial University on two occasions for training.

THE PRINCIPAL GOALS OF CCLAS

We have five principal goals. First, we wish to contribute to the literature on L1 acquisition, which, as noted above, includes little discussion of data from languages typologically similar to Algonquian. Second, through this project we will contribute to documentation of (East) Cree, producing literature aimed at both the speech community and at an academic audience. Third, we

wish to refine the protocols we have established for L1 research at a distance. Fourth, the project is utilizing software specialized in structuring L1 databases which facilitate L1 data analyses (*Phon*; Rose et al. 2006). By feeding Cree data into the software (developed to handle L1 data from non-polysynthetic languages), it is refined to handle an Algonquian language – this will serve other researchers who wish to undertake an L1 study, either of an Algonquian language, or of a language typologically similar. Finally, this study will make benchmark data on L1 acquisition process for Cree accessible to the speech community with, for use in the domains of Education (curriculum development) and Health (Speech Language Pathology services). While the population covered by our study is by no means large enough to provide a normative baseline, our study has the merit of providing a first step in this direction.

VIDEO-RECORDING PROCEDURES AND PROJECT PERSONNEL

Darlene Bearskin, CCLAS project manager in Chisasibi, is both a community member and a native speaker of NE Cree. She makes the video recordings of the participants and also takes care of family liaison, ensuring that the children are filmed at regular intervals. Family liaison has turned out to be a fairly time-consuming part of the project, as children are often unable to keep scheduled appointments, due to various family commitments, as well as the days that are inevitably lost to sickness. Some of the children are filmed at their homes, others, for the convenience of their families, are filmed at the Anjabowa Childcare Centre. The (2004) Executive Board at Anjabowa Childcare Centre was very supportive of the project and generously allowed us to film some of the children in their small gymnasium. Subsequent Executive Boards have continued to allow CCLAS to film at this location.

Our normal procedure is that the children interact only with Darlene and there are no other family members present. This reduces the amount of background noise recorded and greatly facilitates the transcription process. All of the children know Darlene and are comfortable interacting with her. All interactions take place in Cree, although in certain situations the children might use English words.¹⁰ The children are filmed while they are engaged in activities which elicit language – playing with toys, talking about what they have done since they last saw

¹⁰ We have found, for example, that when the children are talking about a picture book, they might use English to name some of the things they see. This is especially the case when the Cree word may not be known to them (e.g., naming animals which are not native to Canada, such as “giraffe” or “tiger.”) Code-switching in this context is a common strategy for bilingual children (see, for example, Nicoladis and Genesee 1996; Nicoladis and Secco 1998).

Darlene, and so on. In order to assist us in deciphering the language the children produce, Darlene repeats any child forms that she feels might be difficult to make out while we are viewing the video. (This is especially important in the case of the younger children whose language can be difficult to make out owing to their production falling short of the target (adult) form.) In this way we have an adult version of certain child utterances actually on video, captured in context. (As we explain shortly, we do eventually obtain target forms for every child form for which clarification is required.)

The equipment we use is fairly inexpensive and has been completely reliable to date: a SONY MiniDV camcorder which is mounted on a small tripod, allowing Darlene to set the camera running and then to move away, interacting with the child on camera, a Sony ECM-MS907 microphone, and the necessary mini DV tapes sums the essence of it.

For each tape that Darlene makes, she transfers the data onto the project computer (Mac G5). She then compresses the file within iMovie and, using the free Fugu FTP transfer software, uploads it to the project computer at Memorial University. The original tapes reside under lock and key at the Cree School Board until one of the research team visits and takes them back to Memorial University, where they are stored under lock and key in the Linguistics Department's Native Languages Archive room. A DVD copy of each movie is made in Chisasibi for the Cree School Board Archive.

Once the movies are on the project computer at Memorial University, the research team in St John's is able to begin the data processing. Since the summer of 2005, CCLAS has employed several undergraduate students who are either doing a major or a minor in Linguistics. Student team members are selected from among those who express an interest in the field of L1 acquisition and training is provided on an ongoing basis. Ideally, these students will seek to be integrated into the intellectual life of the project by continuing on to graduate studies, taking the CCLAS data as the focus of their personal research. To date, we have one student at the Masters level who is doing just this; Erin Swain is investigating the acquisition process for NE Cree metrical stress parameters and phonetic correlates. As well, there are two undergraduate students working with CCLAS. They work in the Speech Sciences and Language Acquisition Laboratory under the supervision of Yvan Rose. For convenience, we henceforth refer to any member of this student team as 'the data processor.' The data goes through a number of stages in order to be ready for analysis.

STAGES IN DATA PROCESSING

The following flow chart provides a summary of the nine stages involved in data processing. A detailed description of each stage is provided in the text below.

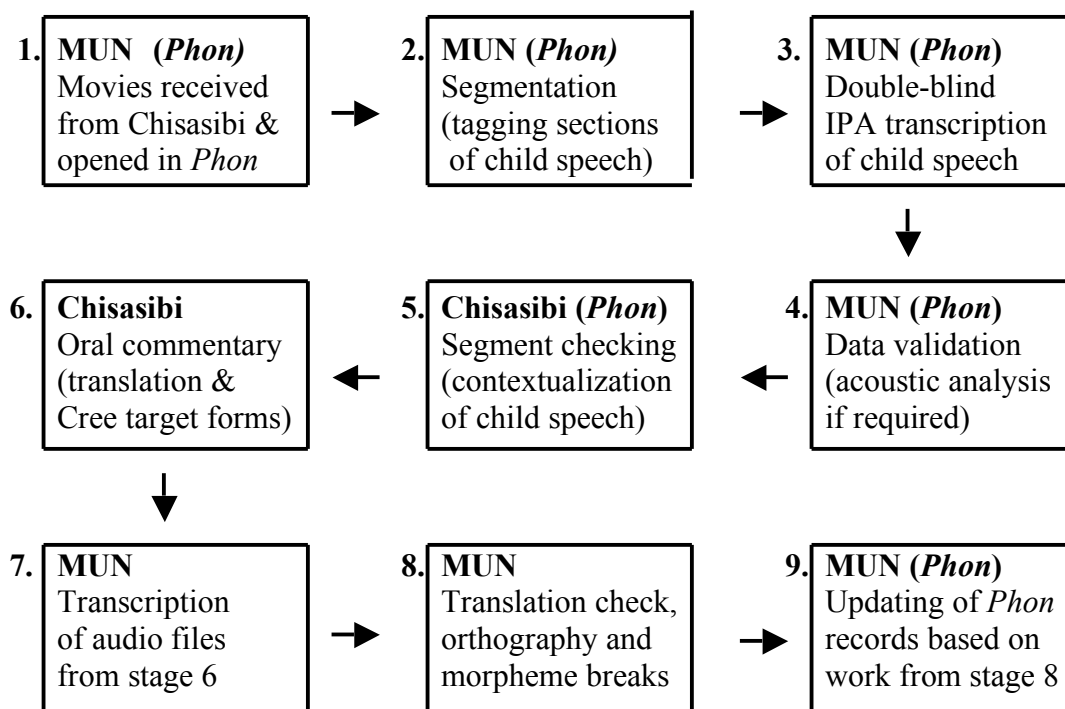


Figure 2. Flowchart of stages in data processing.

Stage 1. Movies opened in *Phon*

Each movie received from Chisasibi is imported into the *Phon* program and linked to a textual transcript that contain fields for, e.g. orthographic and phonetic transcriptions as well as other fields containing translation equivalents and notes. This work is done at Memorial University by data processors.

Stage 2. Segmentation

Using *Phon*, the data processors, who do not speak Cree, watch the movies and electronically tag any sections which contain child speech. The only adult speech that may be transcribed by the

data processors at this stage are cases where the adult repeats a child form, to provide us with the target form (as elaborated on below).

Since an adult Cree speaker (the project manager) is always present in the recordings, the child may often be interacting with the adult. For contextual and discourse reasons, we need a record of any relevant adult interactions with the children. We do not, however, identify relevant adult speech until a later stage of data processing (for obvious reasons, this has to be done by a Cree speaker).

Stage 3. Doubleblind IPA transcription

Using *Phon*, and working independently, two data processors work on the same movie, making a phonetic (IPA) transcription of the portions selected during the segmentation stage. The fact that our transcribers are not native speakers of Cree imposes methodological limits to this step. We however aim at the narrowest transcriptions possible. In order to achieve this, we provide them with thorough training and constant monitoring. In addition, because of the phonological properties of Cree, such as the absence of voicing contrasts in obstruents or its use of phonetic correlates for stress that differ from those of English, arbitrary decisions were made to make the challenge of transcribing the child data more manageable; for example, we transcribe obstruent stops with their voiceless counterparts only. As a result, we are in a position to claim that our data will provide reliable symbolic renditions of the speech produced but acknowledge limitations which can only be circumvented through subsequent verifications by native speakers or computer analyses, as we have done, for example, in our study of the stress system.

Stage 4. Data validation

The two transcribers work in teams to compare their transcriptions, listening again to any portions where their work diverges until they can arrive at a consensus. Where appropriate, transcriptions are supported by acoustic analysis. If no consensus can be reached, the transcription is excluded from further analyses.

By the end of stage 4 we have all of the child utterances recorded in IPA, and some of the relevant adult utterances (target form repetitions). While the data needs to be translated into English, to allow the research team to work with it, we have no translations at this point. The

portions of the movies highlighted in the segmentation stage (which have been transcribed into IPA) are now sent back to the project computer in Chisasibi, where they are received by the Cree-speaking project manager.

Stage 5. Segment checking

Darlene Bearskin listens to the movie segments in *Phon*. Recall, these are stretches of video that have been captured by our non-Cree-speaking data processors. *Phon* allows Darlene to expand the segment, letting her see and hear material that precedes (or follows) the segment identified by the data processors. If there is adult speech in these expanded segments, she determines whether or not it goes with the child utterance. If, for example, it turns out that the child is responding to a question Darlene has asked, the segment is expanded to include the question. At this stage, then, we add in the adult speech that provides the immediate context for the child utterances.

Stage 6. Oral commentary

Stage 6 is very important. In January 2006 we invited Darlene down to Memorial University to spend a week with us trying out the procedure and assisting us in refining it. We are very happy with the results. Several things happen during this stage: (i) translation, from Cree to English, of child language, and of any adult language identified in step 5, (ii) additional target forms are identified as necessary, and (iii) Darlene provides us with as much background information as she can – this greatly assists us in understanding what the child is saying. For example, if the child is talking about a trip into the country, to a particular lake to fish with her grandparents, Darlene will describe the lake for us if she knows it. While in theory any Cree speaker could provide us with stage 6 information, Darlene is the best person to do this work because she was present, interacting with the child, at the time of filming. She can often reconstruct context for us. She is also best placed to understand the younger children as she is accustomed to talking to them. Tasks (i), (ii) and (iii) are undertaken in the form of an oral commentary. We use the *Amadeus II* software program (<http://www.hairersoft.com/Amadeus.html>), allowing Darlene to speak into a microphone connected to the computer. A sample of this oral commentary is provided in (1).

(1) SAMPLE OF ORAL COMMENTARY¹¹

“B1 said ‘[mæwminɔ̯et^həkʌnəbænʔa:],’ which means ‘I will hold this, OK?’”

The recorded sound files are easily sent via the internet back to Memorial University (saved as AIFF (CD-quality) files). Initially, we had asked Darlene to write down the information we needed for stage 6. This turned out to be a fairly inefficient way to go about the work as Darlene had to translate her thoughts on to paper using roman orthography for the Cree (syllabics are used in Chisasibi) and she also had to write in her second language (the English translations). Things speeded up when we switched to oral commentary, and the task became more enjoyable for Darlene as well.

Stage 7. Transcription of audio files

The audio files are transcribed by the data processors. The information provided during stage 6 includes: (i) a broad IPA transcription of the adult Cree speech that has been added in step 6, and the corresponding English translation (in orthography), (ii) a broad IPA transcription of the Cree target forms (what Darlene tells us the child was trying to say at various points of the video where she hears the child produce an immature form), together with the corresponding translation (we already have the IPA of the actual child productions from stages 3 and 4), and (iii) any contextual information Darlene has given us on the segments. The data processors create a (Word) document that contains this information, and this is passed along to Marguerite MacKenzie for stage 8.

Stage 8. Cree orthography and morpheme identification

Marguerite MacKenzie receives the document produced in stage 7 and, using the IPA transcriptions, (i) double checks all the English translations, (ii) provides an orthographic transcription of all the Cree examples, and (iii) provides a morphological breakdown (with morpheme glosses) for each Cree word. This stage results in a document like the following:

¹¹ This example is from Child B1 (Cohort B, #1), who was 44 months at the time of recording.

(2) STAGE 8

<i>Target form, IPA</i>	<i>Translation</i>	<i>Orthography & morphemes</i>	<i>Speaker</i>
1. [mæw.min.ɕʒet ^h əkʌnəbæn.ʔa:]	I will hold this, OK?	maau miin here again chaa=tihkun=imaan aa 2=hold=? Q	B1
2. [ʔeh]	okay	iihii yes	Darlene
3. [gɔgɔga].əʃtɛʔŋ]	I told you, “Grandma Janie” {Lit: Grandma Janie, I said to you}	kuuhkuukaash grandma chit=it=itin 2=say-1>2	B1
4. [ʔeh]	okay	iihii yes	Darlene

Stage 9. Updating *Phon*’s fields

The data processors are now able to take this information and enter it into the relevant fields in *Phon*.

(3)	FIELDS	STAGE DURING WHICH INFORMATION IS RECORDED	EXAMPLE
	IPA actual	3, 4	[wæpʃʃ]
	IPA target	3, 4, 8	[wæp ^h ʃ]
	Cree orthographic form	9, 10	wâpush
	Morpheme analysis	9, 10	wâp- ush ¹²
	Morpheme gloss	9, 10	initial
	Gloss translation	9, 10	“white/light”
	English	6, 8, 9, 10	“rabbit”

¹² We are currently unsure of the gloss for –ush and thus leave it unlabelled.

These nine stages are the essential precursors to preparing the data for linguistic analysis. Crucially, at this stage, any discrepancies between the child's IPA actual production and the target form will be apparent when we compare IPA actual with IPA target. This provides the data necessary for assessing both phonological and morphological development. *Phon*'s alignment module, already capable of automatic phonological alignment between target and actual sounds and syllables, will also facilitate the manual alignment of actual and target morphemes, allowing us to decide which (if not all) have been acquired at any given stage. For example, in (4), below, the researcher manually aligns actual morpheme (mor) production with the target morphemes. Morphemes 2 and 5 have yet to be acquired by the child, while 1, 3 and 4 are present.

(4) HYPOTHETICAL MORPHEME SEQUENCE

Target	mor	mor	mor	mor	mor
Actual	mor	***	mor	mor	***
Morpheme gloss	gl.1	gl.2	gl.3	gl.4	gl.5
Translation	xxxxx				

Here are some more actual examples of B1's speech (at 44 months).¹³

- (5) [kæ.mʃætʃ.ʔɒ.mɒkumæn]
Kaa mishaach uu muuhkumaan
 Kaa+mishaa+ch uu muuhkumaan
 Rel be.big CIN.0 this knife
 "this is the big knife"

- (6) [bədæts.æjægɪnɒtʃ]
 pitaatis aay+aakiniwi+ch
 potato have+passive+CIN.3
 "potatoes ... having to do with"

(Context: the child was playing with a toy potato peeler. Not knowing a Cree word for "potato peeler," s/he creates her/his own label.)

¹³Abbreviations: 0=inanimate subject; 3=3rd person; CIN=Conjunct Indicative Neutral; Rel=relativizer.

WORK COMPLETED TO DATE

Thus far we have completed the following stages of the project:

- Filming: approximately 120 movies (of A1, A2, A3, B1, B2, B3) have been made. Filming with A4 has recently begun. Priority is currently being given to processing data from A1 and B1 through stages 1-9 as outlined above.
- Analysis of adult NE Cree stress system (Dyck et al. 2007), allowing us to begin to look at the acquisition process for this area of the grammar.
- A lay version of Dyck et al. (2006) is in preparation for submission to a community publication in Chisasibi (Dyck et al. 2007).
- Erin Swain, an MA student in the department of Linguistics at Memorial University and part of the CCLAS research team is working on a thesis which compares child language data with adult language acoustic and phonological data, focusing on the acquisition of the stress parameters for NE Cree.
- We have made a number of presentations to the community of Chisasibi, as well as to the wider Quebec Cree audience in public lectures (Brittain et al. 2005a,b, 2006a,b).

CONCLUDING REMARKS

The CCLAS project is groundbreaking on several fronts. It is unique in terms of both the extent and systematicity of its coverage of the acquisition process, both for an Algonquian language and, so far as we know, for a polysynthetic language. This project is set to make a significant empirical contribution in the field of L1 acquisition studies. Drawing on this empirical base, important theoretical questions pertaining to language acquisition can be investigated. We have also used software in order to make the process of data collection and data processing workable across two geographically distant research locations, building on existing infrastructures in both places. This software will also assist us in the analysis stage of the project which, as we approach the end of the data-gathering phase, is where we are now headed. Thus we have created a basic methodology which can be utilized (and/or adapted) by other communities of speakers and researchers who wish to conduct a similar study but find themselves separated by distances too great for regular face-to-face contact. Finally, the database collected by CCLAS represents the first important step in providing the community of Cree speakers with the baseline information

which will, ultimately, allow specialists in the domain of Health to develop a better understanding of speech issues in Cree-speaking populations.

We began with an expression of thanks to the Cree CCLAS families who have been part of the study for the past several years. We wish to end on the same note: ᐃᓄᓂᐅᑦᐱᓇᐱᓇ!

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Toronto: Ontario Ministry of Education.

yrose@mun.ca

mmackenz@mun.ca

cdyck@mun.ca

brittain@mun.ca