INTRODUCTION

While census data (Norris 2007; Bougie 2010) and anecdotal reporting from a variety of different First Nations sources suggest that the intergenerational transmission of Aboriginal languages in Canada is in decline, little research has focused on the nature and scope of Aboriginal language attrition, particularly as it impacts on child speakers. This could well prove a serious oversight. Determining the state of Aboriginal children’s knowledge of their ancestral language is critical to developing effective language maintenance strategies within communities. It is also key to intervening optimally in preschool and school environments. A better understanding of what children know in all of their languages of communication can facilitate the early diagnosis of learning problems, as distinct from normal bilingual lags (Dench et al. 2011), and inform the language-of-instruction decision-making process.

The objective of the present study and the broader research project of which it is part is to respond to the acute need for Aboriginal children to be systematically assessed for knowledge of their ancestral language. Due to a number of practical considerations, our choice of languages fell on Innu, a language of the Algonquian family spoken in south-eastern Quebec and Labrador. Since no large-scale testing of child lexical knowledge has been conducted in Innu or any other Algonquian language, the creation of viable testing instruments became a precondition to achieving our assessment goal. What follows is an explanation of the test creation process and an exploration of the results from 181 young Innu speakers living in one Quebec community.

TARGET COMMUNITY

The community that participated in the initial round of testing is home to approximately 3,000 people, most of whom use Innu on a daily basis. The dominant majority language in the area is French and the community
is situated between two larger French-speaking towns, each approximately 45 kilometers away by well-maintained highway. The frequent contacts between Aboriginals and non-Aboriginals are conducted in French and the community’s children are schooled in French as of first grade. The early childhood, preschool and kindergarten programs are conducted largely in Innu. Children are exposed to both French and English on television. Innu is spoken on the local radio, but most other stations in the area broadcast in French or English. Some books and newsletters are available in Innu, but French is by far the dominant language of print. Innu is the usual language of communication amongst Innu speakers for accomplishing tasks within the community setting. Almost all community members have native-like oral fluency in French and a number have very high-level literacy skills and post-secondary educational qualifications.

At the present moment, the community would score high on most of the UNESCO measures of language vitality (UNESCO 2003): Innu is used by young and old alike across a variety of language domains and tasks, is heard on the radio, and is seen in print. In spite of this apparent vitality, older community members lament the poor quality of the Innu spoken by children and everyone seems to agree that the language is in decline. A small-scale intergenerational language study conducted by Drapeau (1994) in the same community also suggests that knowledge of Innu is decreasing over time. According to estimates made by the kindergarten teachers in the community’s primary school and results obtained through the systematic testing of all preschoolers in Innu (Morris 2013), from 12 to 15 percent of young community members no longer speak Innu at all.

At the present time, few if any community-wide measures have been taken to protect the language. Our hope was that a quantification of the lexical and morphosyntactic knowledge of the community’s young people might provide the impetus needed to raise the profile of language-related issues.

**Lexical Testing in Innu**

Innu is a polysynthetic language and as such poses unique challenges for the assessment of lexical and morphosyntactic knowledge. The absence of large-scale corpora of Innu means that reliance on word frequency and word collocation statistics, pillars of test creation in English and French, is impossible. Testing is also complicated by the fact that Innu does not provide the same range of lexical coverage as most majority languages. With only 8,000 to 14,000 speakers of different levels of fluency and different dialects spread
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across an enormous geographic expanse (ICEM 2007; Moseley 2010), Innu has not been able to keep lexical pace with the growing number of objects and activities to be named as improved telecommunications have linked what once were isolated communities to the rest of the world. For every word not coined and for every word coined but not adopted, Innu speakers have little choice but to borrow a word from the local majority language or simply switch to that language.

The tight intertwining of lexical, derivational, and inflectional morphemes that is characteristic of polysynthetic languages further complicates test creation. The longer and more complex the words tested, the more difficult it is to determine which morphemes test-takers use to arrive at the correct answer and the harder it becomes to maintain test item validity. For example, 'uapamishkueu' 'he has a date with a woman', a relatively simple word in Innu terms, includes the following elements: uapam 'see', ishkueu 'woman', and eu ‘he does something to her’. If knowledge of such a word is tested receptively, what does it take for the test taker to arrive at the right answer? Is recognition of uapam and ishkueu enough? Is knowledge of the derivational and inflectional morphemes also needed? Without knowledge of how Innu words are processed by speakers, these questions cannot be answered at the present moment.

While the judicious use of distracters, plausible but wrong choices, could theoretically lessen the risk of successful guessing on the basis of a single morpheme, finding illustratable distracters in a polysynthetic language is extremely difficult. Changing one morpheme in a word frequently necessitates a change in other morphemes as well, with the result being either additional clues provided to identify the right answer or an undesired obscuring of the core lexical morphemes being targeted.

The interaction of lexical and grammatical elements in the verbs of polysynthetic languages also raises the question of if and how lexical knowledge can be assessed independently of morphosyntactic knowledge. In Indo-European languages, the two are commonly assessed using distinct tasks. The extent to which such a separation is possible in a polysynthetic language in the throes of attrition is a moot point at the moment.

Another typology-related problem to be addressed is the preponderance of verbs in Innu. Approximately 75 percent of the words appearing in comprehensive Innu dictionaries are verbal (Drapeau 1991; Mailhot,

1. Moseley estimates the number at 8,000 speakers while the ICEM estimate is 14,000 speakers. Other estimates tend to fall between these two.
MacKenzie, and Oxford 2013). In contrast, English nouns outnumber verbs at a rate of three to one (Aitchison 2003). Lexical testing in majority Indo-European languages has traditionally been noun-centric. This preference is in part dictated by the sheer frequency of nouns in these languages, but that is not the only factor at work. Verbs are notoriously difficult to illustrate in an unambiguous manner, particularly if the activity described is complex, as is often the case in a polysynthetic language. Indeed, most Innu verbs translate into English or French as complete sentences and base forms can include a subject, a direct or indirect object which may be either animate or inanimate, and perhaps an incorporated noun. Illustrating even relatively simple and frequent Innu verbs in such a manner as to isolate knowledge of the lexical components can be challenging.

A further consideration in deciding on the optimal noun-verb distribution to be targeted is the level of knowledge of the least fluent participants likely to be tested. There is evidence that nouns figure among the earliest words acquired by children regardless of the typology of the language in question (Gentner 1982; Childers and Tomasello 2006; Gentner 2006; Gentner and Boroditsky 2010). If this is the case, the actual noun-verb distribution in the individual lexicons of young, low-proficiency speakers might be more noun-heavy than that of expert speakers.

Creating the Assessment Tasks

We opted to focus primarily on measuring basic expressive and receptive lexical knowledge. Secondary targets included receptive knowledge of a number of morphosyntactic distinctions and a measure of oral fluency. The creation of each element is described below.

In the absence of word frequency data, a decision was made to structure the expressive and receptive lexical components by domain, targeting those fields that were well covered by Innu and accessible to children. This resulted in a test more likely to capture breadth than depth of lexical knowledge, a trade-off we were satisfied with, given the difficulties inherent in measuring depth of vocabulary in any language. We were also reassured by the findings of Vermeer’s (2001) exploration of the relationship between vocabulary breadth and depth which shows significant correlations between the two measures in data from both first and second language children.

A pool of potential nominal and verbal test items by domain was established in conjunction with expert speakers of the language. Since the
initial version of the test was slated for use in three communities, each
with its own dialect, all items were vetted by fluent speakers across partner
communities, as were the pictures selected to illustrate the words. The items
that were well recognized and readily named by local language experts were
retained for the test. These included names for basic household items (e.g.,
knife, spoon, cup, frying pan, etc.), articles of clothing (e.g., socks, boots,
pants, shirt, pajamas, etc.), foodstuffs (e.g., egg, onion, salt, butter, milk,
blueberries, cabbage, etc.), buildings (e.g., church, store, school, etc.), plants
(e.g., fir tree, flower, branch, etc.), animals (e.g., rabbit, bear, porcupine,
skunk, etc.), hunting and trapping implements (e.g., axe, bucket, snare, trap,
etc.), school items (e.g., crayon, ruler, board, book, eraser, etc.), colors (e.g.,
red, black, green, blue, etc.), shapes (e.g., circle, square, triangle, etc.),
body parts (e.g., nose, ears, knee, back, elbow, hair, etc.), daily household
activities (e.g., eating, drinking, sleeping, sweeping, cooking, stirring, etc.),
outdoor summer activities (e.g., running, jumping, swimming, etc.), and
outdoor winter activities (e.g., skating, sledding, shoveling snow, etc.). To
these words were added a series of seven spatial prepositions.

With the exception of a few terms specific to trapping, virtually all of
the words retained are of the type found in early childhood word invento-
ries such as the MacArthur-Bates Communicative Development Inventories
(Dale and Fenson 1996) and were similar to those mentioned by Gentner
and Boroditsky in their 2010 study of Navajo acquisition. No distracters of
any variety were included.

Both the expressive and receptive tasks were picture-based, with the
expressive task requiring picture naming and the receptive task picture
designation. Knowledge of prepositions was assessed receptively with par-
ticipants required to situate a toy cat with respect to a chair according to
instructions. The expressive component, containing a subset of the words
included in the receptive component, was designed to be administered first.

Knowledge of morphosyntax was measured receptively by having
participants point to one of four picture choices correctly representing the
phrase or sentence uttered. The range of possible morphosyntactic features
was limited to what could be clearly illustrated. To this end, we targeted
plurality (animate and inanimate), the diminutive (animate and inanimate),
reflexives, reciprocals, and the obviative.

Oral fluency was assessed by means of a picture-prompted storytelling
task. Participants were shown a picture of three men holding a gigantic fish
and asked to describe events that might have led up to the fish being caught
and what might happen after. The picture was selected because it was likely that even participants with limited knowledge of Innu would know the words for fish and men. In addition, the presence of three men and one fish was likely to trigger different forms of number agreement.

The initial version of the test (expressive lexical knowledge, receptive lexical knowledge, receptive morphosyntactic knowledge, and fluency) was administered to a pilot group of 20 participants ranging in age from 6 to 20. Selection was semi-random in that all of the young people selected were known to have some fluency in Innu. The performance of the pilot group was analyzed by item and poorly performing items were eliminated. In the end, 92 expressive items and 114 receptive items were retained for the lexical components. To these were added seven morphosyntactic items and the storytelling task. While the number of lexical items is admittedly high for a test administered to children, it must be borne in mind that a lack of information about word frequency and the total absence of age norms forced us to test across a wide variety of lexical domains and prevented us from simply terminating the test in the case of repeated wrong answers, as is the usual practice on progressive vocabulary tests in majority languages.

**TEST ADMINISTRATION AND SCORING**

Given the impossibility of using a random sampling for participant selection in a context of language attrition, we adopted an alternative approach to recruiting candidates. We worked in collaboration with Innu teachers from the two community schools to establish that there were approximately 700 potential participants falling into the age range targeted. We then subtracted 100 participants from this total to take into account the 12 to 15 percent of the original pool of participants with little to no Innu at all. We then set out to test as many of the 600 as we could using a completely voluntary approach. In the end, just over 200 young people between the ages of 5 and 24 years agreed to participate, producing 181 usable results. In this manner we assessed approximately one-third of the total available child population.

All tasks were administered by expert speakers of Innu who were from the target community and familiar to participants. For reasons of validity, the expressive lexical component was the first administered, followed by the

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2. Participant attrition most frequently occurred because the young people being tested had to leave before the end of the test because of personal time constraints. Participants rarely gave up because of difficulties with the tasks.
receptive lexical component, the morphosyntactic component, and finally by the storytelling task. Testing took about 45 to 50 minutes per participant.

Given that young Aboriginal test-takers are often shy about talking, even in the presence of an evaluator they know well, assessors were asked to prompt participants with the first syllable of the answer on the productive lexical task.³ All answers recognizable as the target word, prompted or not, were scored as correct. Phonological imperfections were overlooked as long as the assessor was confident the participant was trying to produce the right word. Scoring on the receptive portions of the test, both lexical and morphosyntactic, was one point per correct designation.

RESULTS

The overall results of the 181 participants on the two lexical tasks and the morphosyntactic component are summarized in Table 1. The results of the storytelling task have yet to be transcribed and analyzed, and will not be reported here. All results show success rates expressed as percentages. Since gender was not found to be a significant factor in overall performance, the test population is considered as a whole with no division into male and female participants.

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>M</th>
<th>SD</th>
<th>MIN</th>
<th>MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expressive vocabulary</td>
<td>47</td>
<td>18</td>
<td>7</td>
<td>82</td>
</tr>
<tr>
<td>Receptive vocabulary</td>
<td>72</td>
<td>15</td>
<td>29</td>
<td>97</td>
</tr>
<tr>
<td>Receptive morphosyntax</td>
<td>74</td>
<td>17</td>
<td>14</td>
<td>100</td>
</tr>
</tbody>
</table>

Note: M = mean, SD = standard deviation, Min = lowest score, Max = highest score

Pearson “r” analyses revealed significant correlations between age and each of the skill areas assessed: expressive vocabulary (r = .74), receptive vocabulary (r = .75) and morphosyntax (r = .36). In each instance N = 181 and p < .01.

In a normal lexical testing situation with a frequency-based assessment instrument, robust correlations between age and performance such as those observed here would be both predictable and satisfying; as a rule, older

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³. The first phoneme was used as a prompt in the case of monosyllabic targets.
children know more low-frequency words than younger ones and therefore do better on frequency-based assessments. On the test in question, however, the fact that the lexical items assessed would almost all be highly familiar to five- or six-year-old native speakers in a true mother tongue context makes the strength of the age-results correlations observed more puzzling than reassuring.

In order to explore the interaction of age with results in more detail, receptive and expressive vocabulary totals for all 181 participants were used to form four distinct age subgroups. The performance of each of the four groups on the receptive and expressive lexical tasks was found to differ significantly. The same held true for three of the four subgroups on the morphosyntactic task. Results by age subgroup are summarized in Table 2 below.

<table>
<thead>
<tr>
<th>GROUP</th>
<th>AGE</th>
<th>EXPRESSIVE</th>
<th>RECEPTIVE</th>
<th>MORPHOSYNTAX</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>5–8</td>
<td>49</td>
<td>7.36 (1.09)</td>
<td>32 (12)</td>
<td>59 (13)</td>
</tr>
<tr>
<td>9–12</td>
<td>69</td>
<td>11.12 (1.13)</td>
<td>43 (13)</td>
<td>69 (11)</td>
</tr>
<tr>
<td>13–15</td>
<td>21</td>
<td>14.48 (0.99)</td>
<td>54 (12)</td>
<td>80 (8)</td>
</tr>
<tr>
<td>16–24</td>
<td>42</td>
<td>18.99 (2.10)</td>
<td>67 (13)</td>
<td>87 (7)</td>
</tr>
</tbody>
</table>

The significant performance gaps observed between the different age groups will be discussed below, but before engaging in that discussion, it is useful to examine the results of each age group by lexical domain to determine if a limited number of lexical fields account for the differences observed or if all fields contribute.

Figures 1 and 2 report the average expressive and receptive results of each age group for the words targeted in select domains.

A chi-square analysis reveals the gap between the strongest and weakest performing groups to be statistically significant in every domain and across both task types. For some domains, all four age groups differed significantly in performance levels. In short, the differences in knowledge levels by age group are not confined to a few fields. The gap between expressive and receptive knowledge observed in the overall results also proved to be significant across most lexical domains.
Figure 1. Expressive Results by Age Group and Domain (%)

Figure 2. Receptive Results by Age Group and Domain (%)

DISCUSSION

From a language maintenance perspective, the results achieved by the participants can broadly be described as disquieting. Given that test-takers were all volunteers with knowledge of Innu and that the words tested were basic ones presented in the absence of distracters, the low levels of expressive and receptive lexical knowledge displayed by participants across domains does not augur well for the long-term survival of the Innu language. In typical mother tongue contexts, children as young as five or six would be able to name the vast majority of the items we assessed (Stuart et al. 2003). Indeed, the Innu children themselves showed high levels of knowledge of the test items in French by using that language to name many of the items they struggled with in Innu. They also used French to ask for clarification concerning what was shown in pictures used in the expressive component.

While it is perfectly normal for older children to know more words than younger ones, we had not expected to find four distinct age subgroups within our population given the nature of the lexical items tested and the fact that age was likely to be less important a factor than family language practices in a context of language attrition. There are two possible explanations for the importance of age in our study. It could be that words usually transmitted in the home environment are being acquired later on in the community as the children interact in Innu with more fluent community members. It may also be that the quality of contact with Innu in the home environment is in sharp decline, and that young people now in their late teens and early twenties had much richer exposure to the language in their childhood than younger children do today. Sadly, neither scenario augurs well for the long-term survival of the language because each precludes the possibility of robust intergenerational transmission of Innu.

Native-like levels of receptive and expressive knowledge (items which almost all participants were able to designate and name) were limited to a small number of words from a limited range of domains, namely everyday activities, basic articles of clothing, core body parts, and common household items.

Words drawn from domains associated with traditional Innu culture—hunting and trapping, plants and animals—proved to be almost all poorly known. While it is true that virtually no one in the target community lives traditionally off the land today, the inability of many test-takers to name or
recognize the names of local animals (e.g., skunk, porcupine, bear, squirrel), plants (e.g., fir tree), and berries (e.g., blueberries, strawberries) was both unexpected and fraught with consequences. One of the common arguments used to explain the poor academic performance of Aboriginal children following provincial curricula, using standard textbooks and being assessed by means of standard majority language instruments, is the existence of a mismatch between the children’s reality and educational materials, with materials failing to represent Aboriginal traditions. However, if the children do not know basic lexical items in the fields that are purported to represent their reality and sphere of interest, the validity of such claims needs to be questioned. Normally-developing children routinely acquire the words they hear spoken around them (Kuhl 2010). If the participants in our study were not learning Innu words related to traditional pursuits and local flora and fauna, it is likely because no one in the community is using such words in their presence. This suggests that the argument holding that Innu children need to have learning materials based on past or traditional Innu pursuits because these fall more within their sphere of interest, comfort, and understanding might be unfounded.

Also failing to transfer to children are words one would expect to hear used in preschool context, particularly one in which the language of instruction is Innu. It is hard to imagine children spending a year in pre-kindergarten and another in kindergarten largely in Innu and not learning the words for ‘elbow’, ‘knee’, and ‘forehead’; the names for basic school items; any color names but ‘red’ and ‘black’; or any shape names but ‘circle’. However, the results of our study indicate that this is what is happening. Virtually all of the young people tested had done their pre-kindergarten and kindergarten years completely or partially in Innu, but nonetheless struggled with the words one might expect them to have acquired in a preschool context.

The extent to which receptive knowledge outstripped expressive on most words is a further cause for concern. People systematically recognize far more words in a language than they can say, but for highly frequent lexical items most speakers display close to perfect expressive and receptive knowledge. Even for low-level second language speakers, expressive and

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4. See Battiste (2002) for an overview of various arguments leaning in this direction.
receptive success rates normally only differ substantially when infrequent words are tested (Laufer 1998). Although the length of many Innu words may have lowered expressive scores to a certain extent, it is unlikely that word length alone accounts for the totality of the expressive-receptive gap observed. It is far more probable that the pool of Innu words actively drawn upon by children is shallow.

On a more positive note, participants’ receptive knowledge of plural, diminutive, reflexive, and reciprocal morphemes proved to be quite robust. Virtually all of the children tested were able to recognize these morphemes with high levels of accuracy, even when their overall lexical knowledge was relatively weak. In contrast, few showed mastery of obviative. Two factors may have played a role in the children’s difficulties with this form. First, the obviative was tested in a context that required participants to use the morpheme to override canonical SVO order (e.g., *Ishkuessa uapameu napess*. Glossed as ‘girl+obviative’ ‘s/he sees’ ‘boy’ = ‘The boy sees the girl’). Second, in the dialect in which testing was conducted the allomorphic realization of the obviative ending is a change in tone that might be hard to perceive for participants with lower levels of Innu exposure and clear French dominance. Unfortunately, the polarized morphosyntactic results obtained—close to a ceiling effect for the plural, the diminutive, the reflexive and the reciprocal, and close to a floor effect for the obviative—make it difficult to determine the exact nature of the forces at work. Most children tested were clearly sensitive to morphological markers of plurality, the diminutive, reciprocity and reflexivity, but their knowledge of the many finer distinctions made by Innu was not assessed within the framework of the test used. A more in-depth investigation of the morphological knowledge children have of Innu is called for, including an assessment of morphemes that vary in terms of their phonological salience, their frequency, and their interaction with syntax.

**CONCLUSION**

Trying to assess child knowledge of an Aboriginal language caught in the throes of attrition is a difficult undertaking. Validity and reliability are threat-

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5. Word length, as measured in syllables, correlated significantly but at a relatively low level with success rates on the expressive task (r = –.29, sig. <.01). No significant correlation was found with receptive results.
ened by problems posed by typological differences, limited domain coverage, differences in dialect, wide variations in levels of lexical knowledge between individuals, and difficulties in recruiting participants. While we cannot claim to have addressed all of these issues in a completely satisfactory manner, we feel that the instruments we designed controlled for enough variables to provide valid insight into the current state of child knowledge of Innu in the target community. High participation rates further bolstered the reliability of the results achieved.

Although we feel that the test we designed worked well in assessing the breadth of the lexical knowledge of most participants, we are cognizant of the fact that our exploration of the knowledge young people have of Innu is lacking in depth and provides little information concerning what the more linguistically skilled participants know, particularly in terms of morphosyntactic knowledge. A second round of testing is clearly required to get at what more proficient young Innu speakers know about the subtle interactions of derivational and inflectional morphemes with semantic and syntactic constraints.

We believe that the results we now possess are sufficiently robust to allow us to take the key step of moving beyond the anecdotal into the documented. We have numbers that can be presented to communities to argue in favor of a more concerted effort to ensure intergenerational language transmission, to government bodies to argue for more funding for Aboriginal language maintenance, and to the research world to argue in favor of more testing initiatives in other language groups. While the results achieved by the participants who volunteered to take part in our study are a cause for considerable concern from a variety of points of view, they will hopefully allow the issue of language loss to be brought out in the open and placed before those who have the power and will to reverse the trends observed.

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