The Effect of Majority Language Exposure on Minority Language Skills: The Case of Inuktitut

Shanley E.M. Allen
Boston University, Boston, MA, USA

Martha Crago
University of Montreal, Montreal, Quebec, Canada

Diane Pesco
University of Waterloo, Waterloo, Ontario, Canada

Children who are native speakers of minority languages often experience stagnation or decline in that language when exposed to a majority language in a school or community situation. This paper examines such a situation among the Inuit of arctic Quebec. All 18 participants in the study were native speakers of Inuktitut, living in home environments that were functionally monolingual in Inuktitut. Half lived in communities with relatively high exposure to the majority language (English), while the other half lived in communities with low exposure. One third of each group were in Grade 3 (first year of school exposure to majority language), one third in Grade 8/9 (sixth year of school exposure) and one third were adults. Each participant narrated a 24-page wordless picture book (Frog Story) in Inuktitut. Narrations were analysed for story length, lexical diversity, grammatical complexity and narrative structure – all measures that are expected to increase or show improvement with increased language ability. Results are inconclusive; some suggest that higher exposure to English leads to stagnation in Inuktitut, while others do not. Methodological issues are discussed, and suggestions for further research are provided.

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Children raised in minority language contexts in North America face a dual goal with respect to language learning. On the one hand, they seek to maintain strong skills in their heritage language – the language which they learnt from birth within the home, and which sometimes is also the language of the first year or more of formal schooling. On the other hand, they seek to develop strong skills in their second language – the majority language of the dominant culture, and usually the language of the majority of formal schooling. Ideally, these children would also develop strong skills in both forms of language proficiency identified by Cummins (2000) and other researchers: the conversational proficiency required to carry on day-to-day interactions where the situation or context provides much of the meaning, and the academic language proficiency required for interaction in decontextualised settings where
language itself carries the burden of meaning and where abstract forms of language are used in analysis and problem-solving. However, this is not an easy task. Often the home and community situations in which the heritage language is spoken naturally do not provide sufficient contexts for the development of academic language proficiency. Further, the school typically focuses on fostering development of academic language skills in the majority language at the (often unintentional) expense of the heritage language. In addition, minority language children often do not possess sufficient skill in the second language to maximise their learning opportunities at school, and thus may not end up with strong academic language skills in the second language either (Taylor et al., 2000; Wright et al., 2000).

The Inuit of Nunavik (northern Quebec) are one example of heritage language speakers facing the challenges of schooling in a majority language. Their language, Inuktitut, is described by researchers as one of the few aboriginal languages in North America that has the potential for long-term survival (Foster, 1982; Priest, 1985). This is at least partly due to the relative geographic isolation of Nunavik and the relatively late intrusion of mainstream North American culture in the form of media and schooling (Dorais, 1996). The 14 communities of Nunavik range in population from approximately 100 to 1100 inhabitants, with a total of some 7000 inhabitants in all, and are accessible only by plane, snowmobile (in the winter), and cargo ship (in the summer). In the smaller communities, the population is about 95% Inuit, the remaining 5% being non-Inuit men married to Inuit women, and resident teachers and nurses. Inuktitut is the usual language of interaction in home life and business in these communities, with English or French being used only when one of the interlocutors does not speak Inuktitut. In the larger communities, the population is about 80% Inuit, with the remaining 20% being non-Inuit spouses, teachers, nurses, government workers, trade professionals (e.g. electricians), and the like. In these communities, much more interaction happens in the majority languages, especially outside the home (Dorais, 1989). Non-Inuit, even those who are married to Inuit and have lived in Inuit communities for many years, rarely learn more Inuktitut than a small set of frequently used words and conversational phrases.

Inuktitut is learned as the first language by virtually all Inuit children in this region. According to the federal census of 1991, a full 96.5% of the 6535 individuals in Nunavik who identified Inuktitut as their mother tongue continued to use Inuktitut at home, even though 62% of those individuals also identified themselves as bilingual in either English or French (Dorais, 1996: 54–56). (The study discussed in this paper reports on data collected in 1995, so the 1991 census represents the data relevant at that time.) The literacy rate in Inuktitut is close to 100%, although reading materials are scarce apart from local and regional newspapers, elementary school materials and the Bible.

Each community is served by a local school offering education from Grades K through 11 (as is standard in the rest of Quebec), run and operated by an Inuit-controlled school board. Educational policies encourage development of both the native (Inuktitut) and majority (English or French) languages. The self-proclaimed mandate of the local Inuit school board is ‘to develop a curriculum that embraces and preserves native traditions, culture and
language, and prepares students for active participation in the modern world’ (Kativik School Board, 1985: 11). This implies a goal of additive bilingualism (Lambert, 1977; Lambert & Taylor, 1983), with the intention that fluency in a second language must be acquired without compromising fluency in the heritage language. In contrast to most other aboriginal communities in Northern Canada, which receive all of their education in a second language, most of the Inuit of Nunavik receive schooling from Grades K through 2 solely in Inuktitut, taught by Inuit teachers from their communities. (The largest community, Kuujjuaq, also offers K-2 schooling in English and French due to the large number of native speakers of these languages resident in the community.) From Grade 3 on, children are taught content classes in one of the majority languages – English or French – by native speakers of those languages from Southern Canada. In addition, they continue to receive a few classes a week in their heritage language in such subjects as Inuktitut language, culture, religion and physical education.\(^1\) Thus, the education system has some characteristics of a total immersion programme and some characteristics of a transitional bilingual education programme (Spada & Lightbown, 2002), both of which are intended to achieve additive bilingualism.

Nevertheless, substantial concerns have been raised about the language abilities of Inuit students in Nunavik in both their heritage and second languages. As for second language abilities, one recent study of academic language proficiency in a secondary-level French-language class found that ‘most of these students’ ability to use French in an academic environment is far from the level that would be required if they were to go on to post-secondary education where their classmates would be francophone students educated in French’ (Spada & Lightbown, 2002: 228–229). Students in the English-speaking classrooms in that study fared better on the tests administered, but still were not at the level typically attained by native speakers entering post-secondary education. (Note that English is the lingua franca in this community, so it is not surprising that the English-learning students fare better than the French-learning ones.) This finding is consistent with a survey conducted by the Kativik School Board in 11 of the 14 communities of Nunavik, which concludes that French-language secondary school teachers across the schools in these communities have concerns about their students’ French-language skills (Kativik School Board, 1998). It is also consistent with graduation statistics: a report by the Nunavik Educational Task Force (1992) indicated that the attendance rate for upper level secondary students is quite low, and many students do not graduate from high school. Although the reasons for these latter findings are complex, they can be attributed at least partly to language-related concerns.

Equally important are concerns related to the native language, Inuktitut. A growing body of work has documented the impressive fluency in Inuktitut achieved by preschool children raised as monolingual speakers of Inuktitut in this region, fully consistent with the linguistic skills expected of a young native speaker (e.g. Allen, 1996, 1998; Allen & Crago, 1996; Crago & Allen, 1998, 2001). A couple of studies also show that many children raised bilingually from birth in Inuktitut and either English or French achieve native-like levels of fluency in Inuktitut, although this depends to some extent on the parents’
choices about language use and value in their home (Allen et al., 2002; Crago et al., 1998). In spite of this initial native fluency in Inuktitut, however, children’s linguistic ability fails to improve at the rate expected in a native speaker once they enter majority language classes in school. A survey on education in Nunavik by the Nunavik Educational Task Force (1992) reports that parents notice a progressive decline in their children’s Inuktitut as they proceed from grade to grade. Another survey of all the inhabitants over the age of 14 in the largest Inuit community in Nunavik reported significant concern about the decline of Inuktitut (Taylor & Wright, 1990). When responding to the two statements ‘Inuit children are losing interest in the Inuit language and culture’ and ‘If Inuit children are taught only in English and French at school they will lose their Inuktitut language’, the 248 Inuit respondents gave a mean rating of approximately 6 on an 11-point Likert scale where ‘0’ represents ‘strongly disagree’ and ‘10’ represents ‘strongly agree’. A recent longitudinal study of the conversational and academic language proficiency of all the children in Grades K through 2 in the same community provides evidence that the language of instruction has a significant effect on their Inuktitut abilities in both domains (Wright et al., 2000). Three groups of Inuktitut-speaking students were studied – one educated from Grades K to 2 solely in Inuktitut, one solely in English and one solely in French. Language abilities were examined via a series of tests administered at the beginning and end of each school year. The Inuktitut abilities of the latter two groups were significantly lower than those of the group educated in Inuktitut as early as the end of Grade K, with the magnitude of the difference increasing through the end of Grade 2. This finding pertains particularly to the use of Inuktitut for literacy and academic purposes, and is crucial given the large body of research which shows that a strong foundation in literacy and language skills in the L1 is key for development of similar skills in the L2 (Cummins, 1991; Durgunoglu, 1997).

These findings are worrying and raise considerable concern about the development of Inuktitut in Inuit children beyond Grade 2 when all students, even those who completed their early schooling in Inuktitut, are educated in a majority language (either English or French). Despite this concern, no study reported to date has investigated the Inuktitut abilities of Inuit children beyond Grade 2. The present study is a preliminary step towards filling that gap. In addition to the findings noted earlier, it was motivated specifically by two concerns among the Inuit of Nunavik at the time of data collection. First, community members felt that the proficiency in Inuktitut of students in Grade 8 (aged 15–16), after 5–6 years of exposure to the majority language in school, was worse than the Inuktitut proficiency of students in Grade 3 (aged 8–9), who were just beginning to be exposed to the majority language in a formal context. Second, community members felt that the proficiency in Inuktitut of the majority of Inuit inhabitants of large communities (around 1000 inhabitants) was worse than the proficiency of the majority of Inuit inhabitants of small communities (around 100–300 inhabitants). This was assumed to be the result of increased contact between Inuktitut and the majority languages (i.e. English and French) because of the greater number of native speakers of majority languages living in the larger communities. Both
of these concerns point to the possibility of subtractive rather than additive bilingualism – that learning a second language in school and being exposed to it frequently in the community is leading to stagnation or decline of the heritage language.

In this study, we investigated the speech of Inuit students in Grades 3 and 8, as well as adults, in both small and large communities. We explored a number of lexical and grammatical aspects of their speech as produced in a spontaneous story narrative, to attempt to test the possibility that the students’ Inuktitut is indeed stagnating or declining as feared. Given that little if any documentation of features of language decline in this language group has been reported, our study also served as an investigation of possible methods for assessing language decline. We hope it will serve as a motivation and starting point for future and more detailed studies.

**Method**

As one way of assessing potential language stagnation and decline across ages and communities, we collected and analysed narratives from speakers of Inuktitut in three different age groups, in both large and small communities.

**Communities**

Three communities in northern Quebec were selected for this study: one large community and two small ones. The large community (1100 inhabitants) has a significant non-Inuktitut-speaking population (20%) and substantial use of English and French in daily social and business interactions. The two small communities (225, 350 inhabitants) have very small non-Inuktitut-speaking populations (5%) and virtually monolingual daily social and business interactions. These were all communities in which we already had established contacts, and thus had easy access to the schools and to adults in the community.

**Participants**

Participants in the study were several adults in each community, as well as all students in Grade 3 (age 8–9) and Grades 8 and 9 (a combined class, ages 15–16) who were from Inuktitut-speaking homes and had been educated solely in Inuktitut through to the end of Grade 2. The adults were chosen at the discretion of the Inuit research assistants, and were known to be strong speakers of Inuktitut. All children in the selected grades participated in this study as part of a larger study on language skills in these communities.

We divided the participants into six groups, based on age and community variables: Grade 3 Large Community (3L), Grade 3 Small Community (3S), Grade 8 Large Community (8L), Grade 8 Small Community (8S), Adult Large Community (AL) and Adult Small Community (AS). We then randomly selected three participants from each of the six groups for detailed study. Table 1 gives the code name, age and gender of each of the selected participants.
Table 1 Subjects

<table>
<thead>
<tr>
<th>Grade</th>
<th>Cty</th>
<th>Name</th>
<th>Agea</th>
<th>Genderb</th>
<th>Schoolingc</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Large</td>
<td>LS, LT, SJ</td>
<td>9;0, 9;1, 9;4</td>
<td>F, F, F</td>
<td>Fre, Eng, Fre</td>
</tr>
<tr>
<td></td>
<td>Small</td>
<td>AT, LA, CS</td>
<td>8;7, 9;1, 9;7</td>
<td>F, F, M</td>
<td>Fre, Fre, Eng</td>
</tr>
<tr>
<td>8</td>
<td>Large</td>
<td>CA, JM, AS</td>
<td>15;3, 15;7, 16;4</td>
<td>M, F, F</td>
<td>Fre, Fre, Eng</td>
</tr>
<tr>
<td></td>
<td>Small</td>
<td>NK, LN, MA</td>
<td>15;4, 16;1, 16;8</td>
<td>F, F, F</td>
<td>Fre, Eng, Eng</td>
</tr>
<tr>
<td>Adult</td>
<td>Large</td>
<td>ET, BK, LM</td>
<td>40s, 40s, 40s</td>
<td>F, F, F</td>
<td>–, –, –</td>
</tr>
<tr>
<td></td>
<td>Small</td>
<td>JO, MN, GA</td>
<td>30s, 40s, 60s</td>
<td>M, F, M</td>
<td>Eng, –, –</td>
</tr>
</tbody>
</table>

*aAge is represented by years;months.
*bF, female; M, male.
*cLanguage of instruction in school after grade 2; Eng, English; Fre, French; –, no formal schooling.

Language

Inuktitut, a language of the Eskimo-Aleut family, is polysynthetic and morphologically ergative. The morphology is agglutinative, with over 400 word-internal morphemes (e.g. verbalisers, nominalisers, auxiliaries, adverbials, adjectivals, time and aspect markers) and over 1000 verbal and nominal cross-referencing markers. Verbal and nominal roots may be followed by up to eight or more word-internal morphemes, one agreement morpheme and optional enclitics. An example is in (1).

(1) *Illujuaraalummuualausimanginamalittauq*.
   illu-juaq-aluk-mut-uaq-lauq-sima-nqgit-nama-li-ttauq
   house-big-EMPH-ALL.SG-go-PAST-PERF-NEG-CTG.1sS-but-also
   ‘But also, because I never went to the really big house.’ (Dorais, 1988: 8)

As in most languages, complexity in Inuktitut is shown in at least two main ways: lexical specificity and morphosyntactic complexity. More advanced speakers typically use more specific vocabulary (e.g. *hard-packed snow* good for *making igloos* as opposed to simply *snow*) when this is appropriate. In addition, more advanced speakers tend to produce longer utterances on average, evidencing more grammatical morphemes and more complex syntactic structures.

Data elicitation

Data were collected by asking each participant to narrate a 24-page wordless picture book entitled *Frog, Where are You?* (Mayer, 1969). This book has been widely used in studies of narrative development in many different languages and cultures (Berman & Slobin, 1994; Strömqvist & Verhoeven, 2004). It is a story about a boy who has a pet dog and a pet frog. At the beginning of the story the frog escapes from his jar. The boy and his dog spend most of the story looking for the frog, first indoors and then outdoors in the woods. They finally find the frog with his/her spouse and children, and bring one of the baby frogs home as a new pet.
The story and the task were considered culturally appropriate for the Inuit participants, and have been used successfully in one other study with Inuit speakers of West Greenlandic (Engberg-Pedersen & Trondhjem, 2004). The characters, animals and settings in the story are familiar ones, or were treated as familiar ones (e.g. the deer was referred to by most participants as a caribou, and the gopher as a lemming). Although there are no trees in the smaller communities since they are above the tree line, most children by the end of Grade 3 have visited a community that has trees or have been exposed to trees through school material and television. Similarly, Inuit rarely treat live animals as pets, but have been exposed to this concept through school material and television and also have their own dolls and stuffed animals. The task of storytelling is a culturally familiar one, although traditional stories are told from memory rather than books. However, by this age, children have been widely exposed to stories in books through school.

This task was selected for a number of reasons. First, it is appropriate for participants across the wide age range we were dealing with, from age 8 to 60. Second, it provides sufficient possibility to reflect a wide range of language abilities as participants can complete the task with minimal or extensive narration. Third, it was expected to be challenging enough to encourage participants to use the limits of their language abilities, but not so challenging as to be unattainable. Fourth, it elicits aspects of both conversational and academic language proficiency. It reflects conversational proficiency because the communication is contextually supported by the pictures in the book, so the participant can count on the book to convey some of the meaning in the interaction. It reflects academic language proficiency because it requires the participant to use language in abstract ways, such as establishing the relationship between events, foregrounding and backgrounding aspects of the story, providing cohesion through appropriate use of various forms of referring expression (e.g. noun phrases versus pronouns), analysing the emotions and motivations of the protagonists, and evaluating the goal of the protagonists and the resolution of that goal. Although many of these factors are implied by the pictures in the book, they are not obvious from context alone, and thus language bears the major burden of conveying them accurately.  

3 Narratives were elicited on an individual basis by Inuk research assistants. Each participant was tested separately in a quiet room at their school (Grades 3 and 8/9) or at home (adults). The participant first looked through the book to familiarise him/herself with the story, and then told the story to the research assistant while still looking at the book. All sessions were audiotaped for later transcription and analysis.

Data analysis

Each of the 18 narratives was transcribed by a native speaker of Inuktitut. Each word in the transcript was then divided into morphemes by a research assistant, and checked for accuracy by the first author. The utterances in (1) through (6) are representative retellings of the second significant event in the story – the discovery of the disappearance of the frog.

4
(1) Grade 3, Large Community

Qimmi-lu surusi-lu tupa-gamik asiiju-juuk nirlinauja-mik.
dog-and boy-and wake-CSV.4dS lose-PAR.3dS frog-MOD.SG

‘When the dog and the boy woke up, they lost the frog.’

(2) Grade 3, Small Community

Surusi asiiju-suq nirlinaujar-mik qimmi-lu nirlinaujaq aju-kainma-mat.
boy lose-IND frog-MOD.SG dog-and frog escape-PAST-3sS

‘The boy and the dog lost the frog because the frog escaped.’

(3) Grade 8, Large Community

Ullaa-kut tupa-tsutik surusi-lu qimmi-lu nirlinauja asiuj-tsuni.
morning- wake-CTM boy-and dog-and frog lose-4sS VIA.SG .4dS

‘When the boy and the dog woke up in the morning the frog was gone.’

(4) Grade 8, Small Community

Ulla-ru-tuar-ma ta-an-na surusi pillitajuu-minik
morning-become PRE-this.one-ABS.SG boy frog-4sS
-as.soon.as-CSV.3sS taku-sar-tuar-suni pi-ta-qa-ngqi-jialik.
see-really-try-CTM.4sS thing-possession-have-NEG-PART

‘When it became morning the boy tried to look at his frog but there was nothing.’

(5) Adult, Large Community

Ullaa-kut Tsaami-kkuuk qimmi-giik tupa-gamik nirlinauja-minnik
morning Tommy-and dog-pair wake-4dS frog-MOD.4Dsg
-VIA.SG companion taku-giar-suni; pi-ta-qa-ngqi-tuq pullauja-up.
see-in.order.to thing-possession-have-NEG-PAR.3sS jar-ERG.SG
-CTM.4sS

‘In the morning Tommy and his dog woke up and went to look over to see their frog; it wasn’t there in the jar.’

(6) Adult, Small Community

Ullaa-kut gauli-tuar-mat tupa-gami pilliga-minik
morning- break.dawn-as.soon.as wake-CSV.4sS frog-MOD.4sS VIA.SG -CSV.3sS
taku-gialo-rami pi-ta-qa-runrai-tu-viniq.
see-in.order.to-CSV.3sS thing-possession-have-no.longer-PAR.3sS-former

‘During the morning when the dawn was breaking, he woke up to look at his frog that wasn’t there anymore.’

Then each narrative was assessed for indicators of linguistic complexity in the areas of fluency, lexicon, grammar and narrative structure. Quantitative analyses were performed using CLAN computer programmes available through the CHILDES network (MacWhinney, 2000). We assumed that each of the three quantitative measures – number of words per narrative, mean length of words in morphemes and lexical diversity – would increase with greater proficiency in the language. To assess the narratives from a more qualitative point of view, we reviewed each transcript with an Inuk research
collaborator, searching for any indicators of linguistic complexity or lack thereof. Note that the measures used in this study are similar to those used by Wright et al. (2000) in their study of the language proficiency of Inuit children in Grades K through 2.

Results

Fluency

Fluency was assessed by a very simple measure of story length: the number of words per narrative. We assumed that the number of words used would be higher for more linguistically advanced narratives, reflecting both increased fluency and increased verbal expressiveness.

A similar measure, number of words produced in 12 minutes of conversation, was shown by Miller (1991) to strongly predict age (and thus level of development) in a study of children aged 3–13 with language disorders. Berman and Slobin (1994) measured length of narrative in clauses, although they state that ‘length is not criterial for producing a felicitous narrative based on the frog story picture book.’ They found no significant differences in length across age groups (3, 4, 5, 9, adult), chiefly because of the variability in narrative length across subjects. Given the results in Miller (1991), we chose to use this measure in spite of Berman and Slobin’s findings, assuming that it might indeed be useful in a language decline situation where fluency is one of the things being assessed.

We counted the number of word tokens used in each of the 18 narratives, and then calculated the mean number of word tokens for each of the six groups of participants. The results are given in Table 2.

Within each community-size group, narratives contained more words for the older groups of participants. This is consistent with the effects of development: as age increases, so does the amount of speech produced in a given constrained context. Within each age group, more words were used on average in narratives from participants living in small communities than in those from participants living in large communities. This is unexpected as a

<table>
<thead>
<tr>
<th>Grade</th>
<th>Community</th>
<th>Number of words</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Range</td>
</tr>
<tr>
<td>3</td>
<td>Large</td>
<td>71–103</td>
</tr>
<tr>
<td></td>
<td>Small</td>
<td>87–127</td>
</tr>
<tr>
<td>8</td>
<td>Large</td>
<td>97–122</td>
</tr>
<tr>
<td></td>
<td>Small</td>
<td>108–166</td>
</tr>
<tr>
<td>Adult</td>
<td>Large</td>
<td>171–189</td>
</tr>
<tr>
<td></td>
<td>Small</td>
<td>225–714</td>
</tr>
</tbody>
</table>
result of development, as one would assume that speakers of the same age would be equivalently proficient in the language regardless of the community they live in. This result, then, may reveal language stagnation or decline.

**Lexical diversity**

Lexical diversity refers to the range in variety of lexical items used in a given data sample, and is assumed to be larger for a more linguistically complex data sample. This is a widely used measure of language development, and typically correlates with age even into the teens (Miller, 1991). It is usually assessed quantitatively by means of a type-token ratio (TTR): dividing the total number of different words used (types) by the total number of words used overall (tokens). However, it is well known that this measure is very sensitive to differences in sample size, such that TTR tends to decrease as sample size increases, independent of other factors. This effect can be controlled for by holding constant the number of words considered for each sample, but that has the drawback of not considering the full range of data available for each sample. An alternative method of assessing lexical diversity has recently been developed, which determines a diversity parameter (D) indicating the steepness of the curve representing the relationship between type-token ratio and increasing token size (Malvern et al., 2004). This method uses the full set of data available, and is not affected by sample size. We therefore used this method to assess lexical diversity in our data.

Lexical diversity is also usually calculated on the basis of words. However, this is neither practical nor sensible for a language with the polysynthetic typology of Inuktitut. Therefore, we calculated lexical diversity on the basis of morphemes. Using the morpheme as the relevant unit in Inuktitut is similar to using the word for a language like English, because a substantial proportion of Inuktitut bound morphemes translate as separate words in English. We calculated morpheme diversity for each of the 18 narratives separately, then averaged the results for each of the six groups. Figures for lexical diversity are given in Table 3.

Morpheme diversity is clearly larger as age increases, regardless of community size. These differences are largest for the participants from large communities. Within age groups, morpheme diversity is larger for narratives

<table>
<thead>
<tr>
<th>Grade</th>
<th>Community</th>
<th>Mean types</th>
<th>Mean tokens</th>
<th>Mean diversity</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
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<td>69</td>
<td>210</td>
<td>19.01</td>
</tr>
<tr>
<td></td>
<td>Small</td>
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<td>284</td>
<td>30.58</td>
</tr>
<tr>
<td>8</td>
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<td>106</td>
<td>276</td>
<td>33.08</td>
</tr>
<tr>
<td></td>
<td>Small</td>
<td>129</td>
<td>353</td>
<td>40.06</td>
</tr>
<tr>
<td>Adult</td>
<td>Large</td>
<td>197</td>
<td>609</td>
<td>65.78</td>
</tr>
<tr>
<td></td>
<td>Small</td>
<td>263</td>
<td>1371</td>
<td>67.71</td>
</tr>
</tbody>
</table>
from participants living in small communities than from those living in the large community. This difference is largest for the participants in Grade 3, and smallest for the adult participants. Although development in lexical diversity is increasing with age as would be expected, the difference in richness of lexical diversity across community size suggests possible cause for concern. Note, however, that lexical diversity may not necessarily indicate complexity. Tony Woodbury (personal communication) reports that repetition of bases is often considered a sign of elegance and complexity in Yup’ik discourse (an Inuit language spoken in Alaska). If this were true in Inuktitut, it might mean that a lower rather than higher index of diversity would reflect greater discourse ability in this language.

As might be expected from the numerical measures of lexical diversity, we found that richness of vocabulary also tended to increase with age in the narrative samples. At younger ages, participants sometimes used general words when a more specific word would better suit the situation they were describing, as indicated in the examples in (7). At older ages, many more specific and less frequent words were used, as illustrated in (8).

(7) nun'amussijuq ‘goes to the ground’ (katasijuq ‘falls’ would be more precise) (3L)
   takusarsuti ‘they looked at’ (itsuasutit ‘they tried to see’ would be more precise) (8L)
(8) aursaq- ‘dive’, ammalu ‘and’ (8S)
   kangii- ‘pay attention’, ipira- ‘walk in water’, siqa- ‘shatter’, akiruq ‘branch’, -allat ‘even’ (AL)

Several errors in lexical choice are also present in the Grade 3 and Grade 8 narratives. While some may be due to culturally unfamiliar vocabulary (9), others are not (10).

(9) qummujuq ‘tin’ used for pullaujaq ‘jar’ (3L); qattaq ‘pot’ used for pullaujaq ‘jar’ (8L)
(10) naujaq ‘seagull’ used for uppiq ‘owl’ (3S); takunnaq- ‘watch’ used for qiniq- ‘look for’ (3S); piqq- ‘come off’ used for ani- ‘exit’ to describe bees leaving their hive (3S and 8S)

Interestingly, almost no English or French appears in the narratives. A couple of subjects use the word frog, while one subject in the 8L group uses socks, and, jar and squirrel. Given the assumption that majority languages (English and French) have substantial influence on the children, it is surprising that more English and French does not occur in the narratives. This may be because of the genre – use of majority languages may be more common in less formal or structured interactions such as spontaneous conversations, than in the more structured format of a narrative. Also, the narrative data was collected as part of a battery of tests in both Inuktitut and one or both majority languages. Thus, subjects may have been especially careful to stick to Inuktitut for this task, as they knew that they would be (or had been) tested in English and/or French at another time.5
Grammatical complexity

Grammatical complexity of the narratives was assessed by calculating the mean length of words in morphemes (MLW) within each sample (i.e. dividing the total number of morphemes in each narrative by the total number of words). We assumed that the MLW would be higher for more linguistically advanced narratives, reflecting increased structural complexity. This is not a usual measure of complexity in language development research because most languages commonly studied do not allow for much variance in word length. In Inuktitut, however, much of the syntax occurs within the word, in that syntactic features are largely indicated by use of a specific morpheme. Thus, each syntactic feature added to a word would logically mean a morpheme added to that word. We calculated the MLW separately for each narrative and then determined the mean MLW for each of the six groups of participants. Additionally, we calculated the median (midpoint of number of morphemes per word) and range (shortest and longest word used) for each narrative, and determined the mean of each for each of the six groups.

Results are presented in Table 4. These statistics are known to be sensitive to sample size, so we calculated them over all words in the story, as well as over randomly selected samples of both 75 and 100 words. As the pattern of results does not differ across the three analyses, we present only results calculated across all words.

Results for participants in Grade 3 and Grade 8 look very similar for all three measures of word length. Figures for mean and range are slightly higher for Grade 3 than for Grade 8, but this difference is small and almost certainly not significant. Figures for median are virtually equivalent across the two groups. In contrast, figures for each of mean, median and range are substantially higher for adults than for the other two age groups. Within age groups, no differences by community size are apparent. These results also

<table>
<thead>
<tr>
<th>Grade</th>
<th>Community</th>
<th>Length of word in morphemes</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Mean&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>3</td>
<td>Large</td>
<td>2.60</td>
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<tr>
<td></td>
<td>Small</td>
<td>2.55</td>
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<td>8</td>
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<tr>
<td></td>
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<td>2.54</td>
</tr>
<tr>
<td>Adult</td>
<td>Large</td>
<td>3.28</td>
</tr>
<tr>
<td></td>
<td>Small</td>
<td>3.24</td>
</tr>
</tbody>
</table>

<sup>a</sup>Mean of the MLWs calculated for each of the three members of a given group.

<sup>b</sup>Mean of the median word lengths calculated for each of the three members of a given group.

<sup>c</sup>Mean of the range of word lengths calculated for each of the three members of a given group, rounded to the closest whole number (e.g. mean of 8L group ranges 1–5, 1–5 and 1–6 was calculated as 1–5.667, rounded to 1–6).
suggest language stagnation, in that Grade 8 students evidence no more complex words than Grade 3 students.

In our qualitative analysis, three grammatical features were noticeably different across the six groups of narratives. The first is the use of dual versus plural person markers on verbs. Inuktitut consistently distinguishes three numbers – singular, dual and plural. In other Inuit languages such as Greenlandic, however, dual and plural have been merged in recent years. This loss of the dual/plural distinction is considered a normal process of language change in Greenlandic, and one that has occurred in many languages in the world that are still quite vibrant. However, as it is a simplification of the language, it is also a potential indicator of language loss. Note that it is difficult to tell without the benefit of hindsight whether simplifications indicate language change or loss. Simplifications that occur for all speakers over the period of a generation or more, while the language remains vibrant, can best be considered healthy language change. For example, English used to have a case system similar to that of modern day German; though that system has been radically simplified, no one today would consider that the simplification signalled imminent language loss in English. But because the same aspects of grammar tend to be vulnerable in language change and loss (and also acquisition and aphasia), only time can distinguish the two processes in contexts like that of Inuktitut.

All adults and all children in the 8S group (Grade 8, small community) produced dual forms appropriately in all obligatory contexts, correctly distinguishing them from plural forms. In contrast, all children in the 3L group used plural instead of dual verbal inflections in the majority of obligatory contexts, illustrating a potential move towards loss of the dual in this group. An example is shown in (11). One subject each in the groups 3S and 8L showed a similar pattern.

(11) Surusi-lu qimmi-lu takunna-tu-it nirlinaulaa-mik.
    boy-and dog-and watch-NOM-ABS.PL frog-MOD.SG
    ‘The boy and the dog watch (pl) the frog.’

    [ = takunnatuuk]  
    [ = watch-PAR.3dS]  
    [ = ‘watch (du)’]

The second noticeable grammatical difference among narratives is the existence of case marking errors. Several such errors occur in the data, especially using locative case instead of allative case, as shown in (12). In addition, several errors of possessor marking in locative relations occur, as shown in (13).

(12) U-na anguti tuttu-up natju-nginni qaa-nganu-
     this one-ABS.SG man caribou-ERG.SG antler-LOC.3SPl
     ur-suni   go.to-CTM.4Ss

'This man gets on top of the caribou’s antlers’ (lit: ‘caribou’s at its antlers goes to their top’)
[ = natju-nginnuit ]
[ = antlers-ALL.3Spl]
[ = ‘... to its antlers’]

(13) napartuu-ni [ = napartuup immnu-ani ]
    tree-LOC.PL [ = tree-ERG.SG inside-LOC.3Sg ]
‘in the trees’ (i.e. in the branches) [ = ‘at the inside of the tree’]
(describing the boy looking into a hole in the tree)

These errors are most frequent in the 3L group, but also occasionally occur in the 3S and 8S groups.

Finally, several errors in transitivity marking occur; the 3L group particularly shows errors with valency alternating operations such as causative (14). Errors in marking relations between connected events are also common, as in (15).

(14) Qimmi-gulu kata-i-tsun1.
    dog-little fall-ANTP-CTM.4sS [ = fall-CAUS-ANTP-CTM.4sS ]
‘The little dog fell it.’ [ = is making it fall]

(15) Surusi-lu qimmi-lu tapa-tsun1, nirlinaujaq aju-tsun1.
    boy-and dog-and awake-CTM.4dS frog escape-CTM.4sS
‘When the boy and dog woke up, when the frog is escaping.’
(describing a picture in which the frog has escaped before the boy and dog awake)

The quantitative and qualitative measures of grammatical complexity reveal somewhat different patterns. Measures of mean word length showed no difference between any of the Grade 3 and 8 groups, but both the adult groups evidenced substantially longer words on average than the child groups. However, qualitative assessment of individual narratives shows improved accuracy with word-internal grammatical morphology from Grade 3 to Grade 8, and also reveals differences between community size groups for Grade 8. With such small numbers of participants in each group, it is impossible to tell if these differences are typical of other children in these communities or if they are specific to the children in this study. However, the clarity of the tendencies is suggestive that differences may be more widespread than just these children.

**Narrative structure features**

Finally, differences were also evident across groups in terms of overall narrative structure. The first such difference is in time setting. Only the Grade 8 and adult subjects situated their narratives within an overall time frame, by use of such phrases as *ullakut* ‘in the morning’. This is illustrated in the examples in (1) through (6). This type of temporal anchoring is known to develop with age in the frog stories. For example, Berman and Slobin’s (1994) study of 3-, 4-, 5- and 9-year-olds and adults in five languages showed
temporal anchoring in all 9-year-olds and adults and some 5-year-olds, but not at all in 3- and 4-year-olds.

A second difference is in the level of descriptive detail. Participants in the Grade 3 groups tend to give only the bare details of the story without much description, and to limit their stories to one utterance of about five words per page of the book. Participants in the 8L group use longer words than the Grade 3 participants, but their sentences overall are not strikingly longer or more complex. Participants in the 8S group use longer sentences, and go into some depth about the thoughts and motives of the protagonists of the story. The adults’ stories were much more descriptive than the children’s stories, not just narrating the events but going into detail about the physical and emotional setting. These tendencies are illustrated to some extent in examples (1) through (6) above.

Discussion and Implications

This study was a preliminary investigation of two hypotheses: (1) that Inuit children do not develop their linguistic abilities in Inuktitut between Grades 3 and 8 (i.e. between age 8/9 and age 15/16), and (2) that Inuit living in large communities with more community presence of a majority language (i.e. English and French) have weaker language abilities than those living in small communities with relatively little community presence of a majority language. The overall concern is that L2 acquisition of majority languages in Nunavik constitutes subtractive rather than additive bilingualism, leading to stagnation and perhaps eventual decline of ability in Inuktitut and undermining the long-term future of that language. We investigated these questions by analysing story narratives produced by 18 native speakers of Inuktitut across three age groups (Grade 3, Grade 8, adult) and two community size groups (large, small). The patterns revealed in the areas of fluency, lexical diversity, grammatical complexity and narrative structure suggest that these concerns around language stagnation and decline are well founded at least to some extent.

Only one quantitative finding suggests that language does not develop significantly between Grades 3 and 8. The length of word in morphemes was essentially the same across participants from Grade 3 and 8, regardless of community size (group means between 2.52 and 2.60 morphemes per word). In contrast, adults in both communities used substantially longer words, with means of 3.28 and 3.24 in the large and small communities respectively. Also perhaps worrying is that both Grade 3 and Grade 8 participants evidenced some vocabulary and grammatical errors. These were somewhat more prevalent in the 3L group, but also appeared in the 3S and 8L groups. In contrast, substantial development occurred between Grade 3 and 8 in number of words per narrative, lexical diversity and features of narrative structure. These somewhat conflicting results suggest that concern about language development between Grades 3 and 8 is not unwarranted, but further study with a larger number of participants, and perhaps more or different tests, is necessary.

Several findings suggest that language abilities are somewhat stronger among same-aged participants in small communities than in large communities. Most clearly, the number of words per narrative is larger in small
Effect of Majority Language Exposure on Minority Language Skills

communities for all three age groups, with the 3S and 8L groups producing the same mean number of words in their narratives. However, the difference across the two adult groups stems primarily from one unusually long narrative (714 words) in the small community group. Lexical diversity is also greater in the small versus large community groups for both Grade 3 and 8 participants (not for adults). Finally, more grammatical errors were evident in the 3L and 8L groups as compared to the 3S and 8S groups respectively. In contrast, no differences across community size were observed for mean length of word in morphemes, overall vocabulary specificity or features of narrative structure. These results are somewhat more worrying than the age-related results just discussed, as they indicate more strongly a disparity in linguistic ability between large and small community participants of the same age. Inhabitants in communities in which exposure to majority languages is common seem to have somewhat less strong abilities in Inuktitut than inhabitants in communities with little exposure to majority languages. But again, further study is necessary to confirm these findings.

While these data are suggestive, further research investigating these factors in more depth must be done before firm decisions about language stagnation and decline in northern Quebec can be made. As with any preliminary study, there are several other possible explanations for the results. One is the stimulus and testing situation. For example, it may be that Grade 8 students are more reluctant than Grade 3 students to perform a seemingly pointless task imposed on them, so they may not have demonstrated the full extent of their Inuktitut abilities in this task. Further, it may be relatively uncomfortable in Inuit culture for teenagers and younger children to talk at length or expand on a narrative theme. 

Crago (1988), in a study of early language socialisation practices among the Inuit in Northern Quebec, found that older mothers (in their 40s and 50s) were much more likely than younger ones (in their 20s and 30s) to provide extensive explanations to their children. This was not due to lack of language skills, but rather to appropriate speaking roles for various aged people. Future studies should thus investigate alternative ways of obtaining language samples that might prove more comfortable and meaningful for the participants.

A second alternative explanation could be variability in participants. We analysed only three narratives from each group, which may well not be a representative enough sample upon which to base conclusions. They may have inadvertently been the three weakest or strongest possible participants in their age group and community size, thus skewing the results. Further, for some of the measures used, there is likely substantial variability across participants even under typical conditions. For example, Berman and Slobin (1994) found very large differences across the 20 participants, in each of their five age groups in terms of the number of clauses produced per narrative. With only three participants in each of the six groups, it is very difficult to know if the results represent typical patterns for these groups, or patterns specific to the individuals who participated in this study, unless the differences between the groups are extremely clear. It may well be, then, that further analysis of more narratives may lead to other conclusions than the ones represented here.

Third, we assessed only a small subset of the students’ language skills as assessed by only one task. A larger number of tasks assessing a wider range of
language skills would be necessary to make the findings more conclusive. Several additional quantitative tests could be performed using narrative data of the sort we analysed here. These include more precise measures of grammatical complexity such as proportion of subordinate or relative clauses and mean length of turn or utterance. Also useful would be an assessment of the linguistic skills related to narratives such as reference tracking, time anchoring, marking of causal relations, temporal linking devices, analysis of the plot structure, use of evaluative language and use of descriptive rather than general phrases. Beyond narrative data, many other tests could be used including carefully adapted versions of standardised tests common in assessment of language development and disorders.

Fourth, all languages undergo a process of natural historical change, and that may explain some of the results. For example, most Inuit languages and dialects have lost the tripartite number marking system, and now mark only singular versus plural instead of singular versus dual versus plural as in Inuktitut. It would not be unreasonable to suspect that Inuktitut is also in the beginning of such a natural change, and that the supposed ‘errors’ we see in Grade 3 and 8 participants with respect to number marking actual represent a general shift in number marking in the language.

In this paper, we have shown that Inuit parents are not wrong to be concerned about the potential effects of exposure to majority languages (English and French) on their children’s Inuktitut. Some of our measures indicate that children in Grade 8 (with five years of schooling in a majority language) have similar Inuktitut abilities to those in Grade 3 (just beginning formal exposure to a majority language). More measures show that children in large communities (with more community presence of majority languages) do not compare favourably with same-aged children in small communities (with little presence of majority languages) in their Inuktitut abilities. However, other measures that we used show age-appropriate differences in language abilities, and fail to show differences by community size, so the overall findings are not conclusive. In addition, further research should attempt to rule out each of the alternative explanations noted earlier before far-reaching decisions are made about Inuit language policy. Our main contribution here is twofold. First, we have explored several methodologies that might be useful in further studies of language stagnation and decline among Inuktitut speakers. Second, we have underlined that continued vigilance in the domain of language maintenance and decline in Inuktitut is warranted.

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Correspondence
Any correspondence should be directed to Shanley Allen, School of Education, Boston University, Two Sherborn Street, Boston, MA 02215, USA (shanley@bu.edu).

Notes
1. In the 2004–2005 academic year, students in Grade 3 received about half their education in Inuktitut and half in English, including content area teaching in Inuktitut. In addition, some content material in social studies is now being taught in Inuktitut at the secondary level. However, neither of these practices was in place at the time the data reported here were collected (June 1995).
2. Participants in the Grade 8/9 group were older in age than would be expected if they completed one grade per year. Unfortunately absenteeism is common beyond elementary grades, so it is often the case that students repeat at least one grade.
3. Note that children’s academic language proficiency may be below the expected age or grade level for a variety of reasons, many of which are unrelated to grammatical competence. In interpreting the results, one must ensure that apparent difficulties are arising directly from grammatical knowledge, and not as a side effect of lower than expected discourse abilities.
4. The following abbreviations are used in the glosses: 3dS, third person dual subject; 3sS, third person singular subject; 4dS, fourth person dual subject; 4sS, fourth person singular subject; 4Dsg, fourth person dual possessor with singular possessum; 4Ssg, fourth person singular possessor with singular possessum; ABS, absolutive case; CSV, causative verbal modality; CTM, contemporative verbal modality; ERG, ergative case; IND, indicative verbal modality; MOD, modalis case; NEG, negative; PAR, participative verbal modality (equivalent to indicative); PART, participial; PAST, past tense; PRE, prefix; SG, singular; VIA, vialis case.
5. Participants were tested in each language on a separate day, with the order of language of testing varied randomly across the pool of participants. Many of the tests were equivalent in each language of testing; participants told the frog story in each language of testing.

References