Identifying Patterns in and Relationships Between Graphic Representations and Talk of Northern Canadian Rural and Indigenous Children

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Abstract

In this paper, we report on the first phase of an initiative to develop a classroom tool to document and describe children's emergent writing. Here, we describe the process through which we developed an analytic framework to assist us in identifying patterns in young northern rural and Indigenous children's graphic representations in response to three formal tasks. Participating children lived in 11 northern, rural communities in two Canadian provinces. The resulting patterns, consistent with those described in the literature on children's emergent writing, suggest the need to explore further how children use the verbal mode while representing meaning graphically.

Introduction

Researchers working within an emergent perspective of writing understand young children as meaning makers, capable of producing a variety of socially situated textual forms that reflect their basic understandings about writing (Harste, Burke, & Woodward, 1982; Kress, 1997; Sulzby, 1985). Past research has documented the development of specific features of young children's writing (e.g., Gombert & Fayol, 1992; Tolchinsky-Landsmann & Levin, 1985) and name writing (e.g., Bloodgood, 1999; Hildreth, 1936; Levin, Both-de Vries, Aram, & Bus, 2005), and how specific domains of emergent writing account for children's written performance on writing-related tasks (e.g., Puranik & Lonigan, 2014). Recently, researchers have sought to create organizational frameworks for understanding aspects of young, English-speaking children's written representations (e.g., Mackenzie, Scull, & Munsie, 2013; Rowe & Wilson, 2015). However, these studies tend to be urban-centric and focus primarily on children's written responses to formal tasks administered in a one-on-one setting.

As researchers participating in a partnership project to support the oral and written language of northern rural and Indigenous children through play, we wanted to build on these recent assessment frameworks to create a tool that will assist participating rural and northern teachers in documenting their students' graphic representations during classroom writing activities. Our goal in this phase of the larger research initiative was to generate an analytic framework to allow us to identify patterns in the children's graphic representations that would assist us in creating such a tool. The purpose of this paper is twofold: to illustrate

the process through which we created the framework and to describe patterns revealed through the application of the framework to young children's graphic representations. Our work builds on past studies of assessment of young children's writing by introducing an alternative framework for analyzing emergent writing. This framework highlights observed patterns in how a group of young Indigenous and non-Indigenous children living in rural and northern communities represent and communicate meaning in the visual mode.

We begin with an introduction to the context of our larger project, of which this multi-phased initiative is a part, and then situate this particular initiative within theory and research. We describe the iterative process through which we developed the framework and the research questions that guided our data analysis. We then discuss the resulting patterns in the graphic representations of young northern and rural children and relate these patterns to previous research. We conclude by highlighting changes to the data collection and analysis procedures for Phase 2 of our initiative.

Context

The aim of the Northern Oral Language and Writing through Play (NOW Play) project—a collaboration between university researchers, teachers, and early childhood educators (ECEs)—is to support the literacy achievement of Indigenous and non-Indigenous children in northern rural communities in Canada. We—university researchers—visit each of the teachers for one-on-one meetings about their individual action research initiatives about five times each school year. Using a dialectic process (Nicholson & Kroll, 2015), we view videos of the children's play that teachers have recorded using iPods, and discuss how the children are responding to the initiatives. Together, we develop theoretical understandings of what play interactions show about young children's language, and social and conceptual learning.

The need for a classroom observation tool to document children's writing development was voiced by participating educators in interviews at the beginning of our six-year project. At this point, they were using developmental tools that focused on children's understandings about print (Gentry, 2007). Having collaboratively created a tool for recording observations of children's social uses of language in play (see Peterson, 2017), participating teachers had gained an interest in expanding their ongoing assessment of children's writing to include content. We would also use this information to inform theory.

Conceptual Framework and Related Research
Conceptual Framework

Educators often think of literacy from a linguistic perspective and place an emphasis on developing children's oral and written modes of communication; however, children are active meaning makers who will make meaning through multiple modes and with any medium at hand (Kress, 1997). As such, *writing* can be conceived of as a graphic mode, with meaning being conveyed through both writing and drawing, and with the different meaning-making potentials of these two forms of representation taken into consideration (Kress, 2000). In writing, meaning is communicated through action, event, and sequence within a narrative, whereas in drawing, meaning is communicated through "the inclusion of visually noticeable elements and by the positioning of these elements in space (Kress, 2000, p. 195).

Children develop as writers through their interactions with others in print-rich environments (Harste et al., 1982; Teale & Sulzby, 1986) and as drawers through their exposure to models of drawing in their natural surroundings, such as the classroom and the home (Anning & Ring, 2004). Although there is no set sequence of development (Sulzby, 1992), researchers have identified patterns in the features of children's graphic representations as they progress towards more conventional forms of writing (Gombert & Fayol, 1992; Levin & Bus, 2003; Puranik & Lonigan, 2011). In general, when presented with writing materials, such as a pencil and paper, and asked to write, young children represent meaning using non-letter forms (e.g., scribbling, wavy lines, circles), letter-like forms (e.g., pseudo letters), or letters (e.g., letters from their own name, other letters). These forms may reflect more the purpose of writing than the child's developmental level (Kenner, 2000).

Researchers espousing the stage theory of drawing (e.g., Kellogg, 1969/2015) view children's early marks as a progression from basic scribbles through to early pictorialism, whereas researchers working within a sociocultural perspective consider how meaning is represented through the child's choice of content (e.g., Anning & Ring, 2004) and how content has been organized on paper (e.g., Bearne, 2017; Lancaster, 2007). Young children express their intended meanings visually through structural clues within the drawing, verbally through rich descriptions as they draw, or as announcements once they complete their drawings (Cox, 2005). By studying the process of drawing as well as the graphic products, educators gain insight into children's cognitive processing which, according to Anning (1997), "can be as informative as studying their language" (p. 237).

Related Research

Assessment. Underpinning traditional writing assessment practices is a belief, as Huot (1996) asserts, that a student's ability to write is a fixed and consistent trait and that trained individuals can score a student's written response on a standardized assessment using a standardized scoring rubric. However, instead of placing their faith in what he calls, the "technology of testing" (p. 549), Huot suggests educators espouse a new type of writing assessment. Rather than establishing validity through statistical calculations of inter-rater reliability, he recommends educators consider the consequences of the assessment, specifically, "the linking of instruction and practical purposes with the concept of measuring students' ability to engage in a specific literacy event or events" (p. 561). In other words, tasks administered to students as part of an assessment should validate what teachers are doing in the classroom.

Writing assessment tools. Rowe and Wilson (2015) designed a standard writing task to generate a set of categories and common vocabulary to describe four features of young children's writing development. Their *Write Start! Writing Assessment* included a photo caption task, which they administered in the fall and spring in one-on-one settings to 139 children, ranging in age from 2 to 5 years. The children were 98% African American, English-speakers, and lived in a low-income neighbourhood in an American city. They concluded that sequenced categories generated through their formal assessment could provide teachers with a "common vocabulary for describing and tracking four important features of young children's writing" (p. 285) and a base from which they could "infer children's current hypotheses and approaches to writing" (p. 285).

Rather than designing a task to generate descriptive categories and a common vocabulary, Mackenzie et al. (2013) designed a procedure for analyzing early writing. Teachers instructed 6 -7 year olds enrolled in Year One classrooms in two Australian states to write freely for a period of 20 minutes. Through their close analysis of selected writing samples, the researchers generated descriptors of competence within the six dimensions of writing from the national curriculum document. They found that the tool successfully considered students' writing development across all six dimensions and concluded that it allowed for "a systematic analysis of writing competence" (p. 386) that would assist teachers in framing their own teaching experiences as well as the learning experiences of their students.

Literacy in rural schools. Educators have expressed concerns with the literacy abilities of young rural children. However, findings from rural education research suggests the need to unpack the relationship between literacy scores and rural conditions. Durham and Smith (2006) looked for a relationship between young children's metropolitan status and their emerging literacy ability. Using multiple measures to assess their reading level at the beginning of kindergarten, the authors determined rural *not* to be a variable. They found that, although non-metropolitan status was associated with lower initial reading scores, a child's educational performance was related to their socioeconomic status and ethnicity. In her review of *No Child Left Behind (NCLB)*, Jimerson (2005) found an incompatibility between the structure of NCLB and the delivery of education in rural settings. For example, she cites statistical problems with high-stakes testing that comes from small population sizes (N's) and suggests this incompatibility as a possible reason why small schools have been labeled as failing.

Corbett and Donehower (2017) recommend rural literacy scholarship be viewed as "an emerging subfield in both literacy studies and rural studies" (p. 1) and suggest that researchers work with educators to better align literacy instruction in school with the social practices of the community. In Canada, a high proportion of individuals with Indigenous backgrounds live in northern and rural communities (Clarke, Surgenor, Imrich, & Wells, 2003). Given the possibility that within these communities young children's early experiences with print might differ from those experienced by children living in more populated southern centres, our goal during this phase of the initiative was to work collaboratively with participants to develop a research-based framework that captures nuances within the children's writing development. Specifically, we wanted to document patterns in the graphic forms they use while drawing and writing, how they visually communicate content, and how they convey their message. It is beyond the scope of our research during this phase to correlate these patterns with the community context.

Methodology

To create a framework, we needed to collect and analyze samples of the students' writing. Although we recognize that children's emergent writing is best understood in a natural setting (Rowe & Wilson, 2015), we drew from past studies on young children's writing (e.g., Gombert & Fayol, 1992; Levin et al., 2005; Puranik & Lonigan, 2011, 2014) and chose to work individually with children, asking them to participate in formal tasks, designed and implemented by the researchers.

This study was conducted in nine communities in two Canadian provinces. Our research sites are located in four northern resource-based towns with populations of 400-7000 people and two fly-in First Nations communities with populations of 200 and 500 people. We also partner with an Aboriginal Head Start program in a northern city. Each of the seven participating rural communities is located 200-700 kilometers from a major urban area. We collaborate with teachers in seven classrooms in three communities in a western province, and 12 classrooms in four Indigenous and two non-Indigenous communities in a central province. The mother tongue of all participating kindergarten and Grade 1 teachers and their students is either English or an Aboriginal English Dialect. Eight of the teachers, working in the First Nations communities and the Aboriginal Head Start program, are Indigenous, and the other 11 teachers across all the communities are non-Indigenous.

In this pilot phase, teachers selected approximately six students of mixed academic abilities to participate with the final sample drawn from those children whose parents/caregivers gave written consent. More specific details of the participating children are found in Table 1.

With the help of various district staff and classroom teachers, researchers collected writing samples in the fall, winter, and spring terms of one school year. In total, we collected 323 writing samples from 162 children. We administered the tasks to the children individually, either in a separate corner of the classroom or in a quiet location, such as the hallway or empty classroom.

Table 1

Participating children

Grade (Age)	Central Province		Western Province	
	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous
Pre-K (3)	8	0	0	0
JK (4)	34	10	0	0
SK (5)	51	15	2	15
Grade 1 (6)	3	1	7	16
Total	96	26	9	31
	122		40	

Selecting the Tasks

We chose to engage the children in three tasks. Here we outline our rationale for each one.

Name writing. During our initial meeting, many of the kindergarten teachers shared with us the goal of wanting their students to write their first names by the end of the school year. Research also recognizes the importance of given names for young children (Clay, 1979), with name writing included in studies assessing young children's early writing development (e.g., Gombert & Fayol, 1992; Levin & Bus, 2003; Puranik, Schreiber, Estabrook, & O'Donnell, 2014). Research has determined that name writing improves more rapidly with age than does the writing of dictated words (Hildreth, 1936; Levin et al.,

2005), and children often use letters from their names in early attempts at writing individual words (Bloodgood, 1999). Given this importance, to begin a session, we asked each child to write his or her name.

Drawing. When given the choice between writing or drawing, young children often choose drawing as their communicative tool since, through drawing, they can focus on content rather than form (Landsmann & Karmiloff-Smith, 1992). The content within drawings often reflects the theme of family (Anning & Ring, 2004; Coates & Coates, 2006). Furthermore, the way in which children arrange individual elements in their drawing suggests syntactic principles similar to those underlying writing systems (Lancaster, 2007). For these reasons, we asked the children to draw a picture about what they liked to do with their family.

Because talk can permeate the child's writing process, providing meaning and the means for getting meaning on paper (Cox, 2005; Dyson, 1983), as part of our assessment, we made notes to capture the child's talk during the drawing task. If children ascribe meaning to elements of their drawings, then drawings are considered to be representational (Martlew & Sorsby, 1995), and so once the drawing was complete, we asked the child to tell us about the drawing.

Writing. Research suggests a developmental pattern in young children's writing (Gombert & Fayol, 1992; Levin & Bus, 2003), yet there is little research evidence to support a precise and invariant sequence in children's writing development (Sulzby, 1992). However, according to Rowe and Wilson (2015), a sequence of categories is "useful for forming general expectations for sequences in which children add new more advanced writing performances to their writing repertoires" and "to tentatively predict the kinds of emergent writing performances children are likely to construct for each writing feature as they gain experience with writing" (p. 285). Rather than generating a sequence of categories to assist teachers in understanding their students' emergent writing development, our goal was to generate a set of descriptors to capture patterns in children's written performances from which teachers might elicit possible next steps to support writing development.

In order to gather samples of children's writing, Mackenzie et al. (2013) engaged children in a free-writing activity. Likewise, we chose to present children with the opportunity to write about what they liked to do after school. Since we were working with young children, we decided to make the assessment dynamic and model for them a strategy for spelling individual words. Specifically, we wrote our question on paper and as we wrote, we stretched out the sounds within individual words before asking the child to write a response. We then asked the child to read back what he or she had written.

Developing the Protocol

At the conclusion of our fall data collection, we met to reflect on the tasks, our administration process, and how we recorded observations. We came to three conclusions. First, the writing samples reflected some variation in how administrators instructed the children to respond to the tasks. For example, at one site, a teacher who was assisting with the administration drew outlines for some children's names and asked the children to trace rather than write their names. Second, the two questions we asked the children might have been confusing since they invoked similar responses. For example, we first asked the children to draw a picture of what they liked to do with their families and then asked them

to write what they liked to do after school. Finally, by making this a dynamic assessment, the complexity of the task analyses may have increased. Based in part on these conclusions and in part on the feedback we received during our meetings with teacher-participants, we decided to revise the tasks and how they would be administered in February/March and May/June.

To standardize the delivery of the tasks, we created a writing task protocol. This protocol included descriptions of the tasks as well as verbal prompts for the administrator to use in response to a child's actions. We also combined task questions so that administrators only asked each child a single question, "What do you like to do with your family?" Following this question, children were prompted to draw a picture, to explain or talk about their picture, to write something about their picture, and then to read back their writing.

During the second and third rounds of data collection, only university researchers, and at one site the school district staff, administered the tasks. We followed our writing task protocol and recorded our observations by checking off boxes directly on an observational checklist and writing notes in corresponding spaces. We administered the protocol to 114 children in September/October, 108 children in February/March, and 101 children in May/June, with 49 students in attendance to participate in all three rounds. Participation varied due to children's attendance on the days of the tasks, children transferring out of the school mid-year, or to children bringing back a signed consent form after the first round of the task.

Determining Variables and Generating Categories

Determining the variables. Following the second and third rounds of data collection, we examined the samples of the children's drawing and writing, and based on our review of the literature and on our own experiences as teachers of young children, we identified features that we believed should be included in our framework. In all three tasks, we were interested in documenting the kinds of marks students made on the page. Within the two writing tasks, we identified two distinct forms: non-letter and letter. Drawing from Kellogg (1969/2015) we identified three distinct forms within the picture task: unidentifiable scribbles, marks, or shapes; unidentifiable images; and identifiable images.

When examining a child's picture, we drew from Anning and Ring (2004) and Bearne (2017), and focused on the content within the picture (e.g., characters, objects) and the child's elaboration of that content. We also noted relational aspects (Lancaster, 2007) such as the size and position of the characters and/or objects within the picture. When examining a child's written response, we focused on the content of the writing (e.g., words or sentences). Drawing from Bear, Invernizzi, Templeton, and Johnston (2008), we focused on spelling stage (e.g., emergent, alphabetic), and from Puranik and Lonigan (2011) and Rowe and Wilson (2015), we looked at linguistic features (e.g, discreteness, directional knowledge). Finally, when examining the message conveyed though both picture and writing, taking from Rowe and Wilson (2015), we focused on the content (linguistic analysis) and coherence (relating verbal response to either the picture or the writing) of the message.

Generating the categories. To generate individual categories within each of our variables, we began an inductive analysis of the writing samples following the second round of data collection. Over several meetings, we sat together to review and describe the

samples. After generating a list of descriptive codes for each variable, we collectively coded a common set of samples. Following the third round of data collection, we brought together a group of graduate students to discuss our variables and codes. We created a coding sheet and selected 10 samples for all of us to code. We discussed the variables and codes for each sample, looked carefully at the variations between us to find agreement, and reviewed the notes we had made while coding. We repeated this process two more times to note the codes that overlapped, described the same items, needed modifications, or could be removed. We then created a spreadsheet for variables with drop-down menus for categories/codes. Once we were confident that our variables and categories reflected the children's writing and drawing, a graduate student was tasked with coding the complete set of 323 samples, with one of the researchers periodically checking for agreement in the codes.

Data Analysis

To identify patterns in the children's graphic representations, we filtered the coded samples by grade and Indigeneity and conducted frequency counts for each of the variables. We also looked at changes in the children's responses over time. The following research questions guided our analysis:

1. What forms do children use when writing their own names, drawing a picture, and composing a message?
2. How do children represent content in their pictures and written texts?
3. When explaining their pictures, how complex is the content of the children's messages and how coherent is the verbal message to the picture content?

Findings

Our analysis of the data within the Pilot Phase of the initiative suggests a range in the graphic representations of young Indigenous and non-Indigenous children living in rural and northern Canadian communities in terms of their form, content, and message.[1] Given the low number of participating Indigenous Grade 1 children and non-Indigenous JK children, the findings will only report on tendencies in the comparison between Indigenous and non-Indigenous SK students.

Graphic Forms

Names. When tasked with writing their names, the children's responses ranged from marks/lines/shapes/scribbles, to letter-like forms, to conventionally formed letters. In the 1st term, 42% of the JK and 81% of the SK Indigenous children, tended to write their names with letters (ranging from random letters to some or all of the letters from their given names), with this number changing in the 3rd term to 70% in JK and 87% in SK. By the end of the school year, all non-Indigenous children in JK and SK, and over half of Indigenous children in JK and SK (56% and 71%) were printing their given names accurately.

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[1] The frequencies reported in the findings take into consideration the number of samples that we could not code (ranging from 15% to 37% across variables). For example, although 101 children were administered the tasks in Term 3, the *Content of Writing* variable only included 77 samples when calculating frequencies. Samples were not coded if part of a task was missing or there was confusion about how to code a variable.

From JK through to Grade 1, almost all children were writing their given names (whether marks or letters) in a straight line. From the beginning of the school year, all Grade 1 children were writing their names conventionally, although the appropriate use of letter case varied. By the end of the year, all non-Indigenous and most Indigenous Grade 1 children were using the appropriate letter cases. Throughout the year, JK children tended to print their names with a mix of letter cases, with slightly over half of the SKs using appropriate upper- and lowercase letters for their names. At the beginning of the school year, most students across all grades were printing their names with somewhat inconsistent letter sizes, with the majority of Grade 1s printing letters with appropriate relative sizes by the end of the year.

Pictures. We found that the children's pictures were composed of scribbles/marks/shapes and images. Almost all Pre-K children drew scribbles/marks/shapes, with JK children beginning the year drawing mainly scribbles and unidentifiable images then ending the year drawing images. SK children began the year drawing unidentifiable images and at the end of the year we could identify most of their images. From Term 1 to Term 3, Indigenous children increased their use of identifiable images from 42% to 82% in JK and 65% to 86% in SK, whereas approximately 87% of non-Indigenous SK children drew identifiable images throughout the year. In all three terms, children in Grade 1 drew pictures using images that could be easily identified.

Words. When children were asked to write about their pictures, our framework revealed they used a range of forms, including marks/lines/shapes, letter-like forms, and letters. By the third term, of the children who printed responses, 65% of JK, 84% of SK, and all Grade 1 children used letters. With very few exceptions, the children's writing in each grade showed evidence of left to right directional knowledge. Almost all the children used a mix of upper- and lowercase letters, with a few SK (9%) and Grade 1 (37%) children using the appropriate cases, and more children printing letters with appropriate relative letter sizes from Term 1 (13%) to Term 3 (29%).

Communicating Content

Pictures. In almost all the drawings, we determined the children intended their marks or images to represent characters (people and animals) and/or objects with some children placing these characters and/or objects into a setting. JK children tended to draw characters more often than objects, but sometimes included objects with their characters. In all grades, some children expressed their ideas by placing both characters and objects in a setting, with this number increasing in Term 3 to 7% of JK, 14% of SK and 43% of Grade 1 children. No Pre-K children included settings in their drawings.

Our framework revealed certain tendencies in the level of detail that the children used to elaborate the content of their pictures. Overall, the majority of students in each grade drew characters, objects, and settings with only a few details and this did not change across the three-task administration. However, over the year, we coded slight changes in the amount of detail used. For example, from beginning to end of school year, the number of children drawing characters with some details increased from 24% to 30% and the number of students (mostly Grade 1s) adding many details to their characters increased from 5% to 9%. The number of children drawing objects with some details increased from 29% to 35% and the number of students adding many details to objects increased from 11% to 23%. The number of children drawing the setting with some details increased from 17%

to 27% and the number of students adding many details to their setting was consistently about 10%.
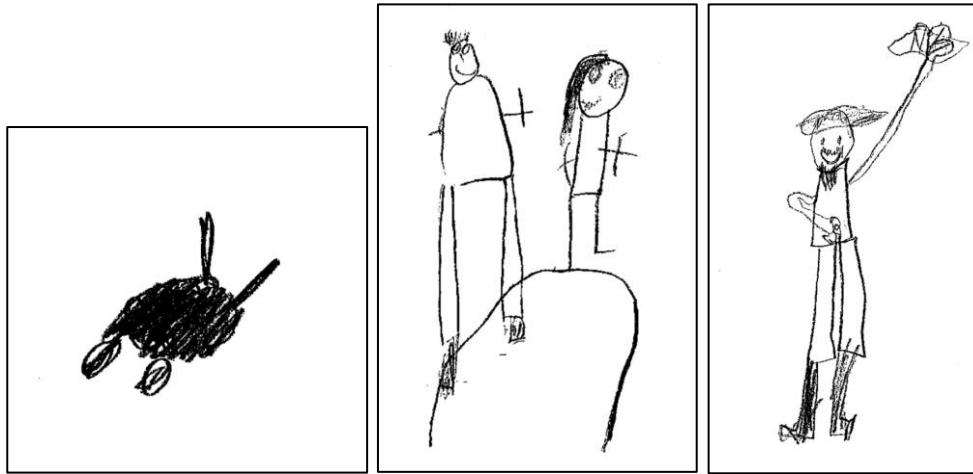

Figure 1. Character details: Students expressed ideas through a *few* character details (left), *some* character details (center), and *many* character details (right).

The students appeared to represent relationships within the content by demonstrating a size difference between and amongst the characters and objects in their pictures. Students typically varied the sizes of their characters to indicate differences between adults and children or people and animals, as well as to indicate differences between characters and objects (e.g., between a person and a checker board or cell phone). A small number of children across the grades (9%) used size to represent differences between all the items they included in their pictures. This number increased slightly (to 16%) by the end of the year.

Figure 2. Size differences: Students expressed ideas through size differences between characters (left), size differences between objects (center), and size differences between characters, between objects, and between characters and objects (right).

Throughout the year, we observed that most JK children drew the items in their pictures *floating* on the page. As the year progressed, we found that SK and Grade 1 children tended to move from drawing items floating to *grounding* their items with a line, frame, or setting (from 23% to 36% in SK, and 50% to 74% in Grade 1).
We found JK and SK children, compared to almost no Grade 1s, tended to draw single items or place multiple items randomly on the page, although this tendency

decreased over the year (from Term 1 to Term 3, 77% to 36% for JK, 53% to 26% for SK). At the end of the year, more students (74%) arranged items on their papers than at the beginning of the year (48%). For example, in Term 3, 28% of children related items in a horizontal line, 11% drew items above or below one another, 27% drew items touching, and 8% (mostly Grade 1s) overlapped items, which created some depth in the picture. This tendency was seen in both Indigenous and non-Indigenous children's pictures during this phase of the initiative and suggests the children may be developing more advanced drawing systems (Matthews, 2003) to better represent meaning in their pictures

Figure 3. Position: Students positioned items in a horizontal line (left), above or below one another (center), and overlapping, showing depth (right).

Words. We found JK children primarily wrote in the *emergent* spelling stage (Bear et al., 2008). Although SK students showed a range of spelling stages, 66% wrote in the emergent stage. By the end of the year, this number decreased to 40%, with the rest of the SK students moving mainly into the early- and mid- *letter name alphabetic* stages. The Grade 1 children started the school year showing a range from emergent through *within word pattern* spelling stages, although most were writing in the letter name alphabetic stage. By the end of the year, 70% of the Grade 1 samples were at or above the within word pattern stage, compared to 11% in October.

We did not observe spelling differences between the Indigenous and non-Indigenous JK children. At the beginning of the year, slightly more Indigenous than non-Indigenous SK children were writing at the emergent stage (76% and 57% respectively), and at the end of the year, this difference was more pronounced (54% and 19% respectively). Although the number of participating Indigenous Grade 1 children was very low, when comparing the Indigenous writing samples to the non-Indigenous samples, the children showed a similar range of spelling stages.

Communicating Message

Pictures. When asked to verbally explain their drawings, the children's responses included: labeling items with a noun or verb, giving simple sentences (subject and verb), using simple sentences with time/place information, and using sentences with more complex details or elaborating beyond their picture information.

Overall, our framework revealed the level of complexity in how students verbally explained their drawings increased. From Term 1 to Term 3, 61% to 79% of students gave verbal explanations beyond a noun/verb label. Most striking was the change over the year in the amount of information that Grade 1 children gave beyond that depicted in their

pictures. The JK and SK children also progressively offered more information about their pictures with their use of single word labels decreasing from fall to spring (see Table 2).

The verbal explanations given by most JK, SK, and all Grade 1, children were directly related to the items drawn in their pictures. Only a small number of students gave verbal responses that seemed to have no relationship to the images in their drawings (5% in Term 1 and 6% in Term 3).

Table 2

How students explained their pictures in Terms 1 and 3 (as expressed in percentages)

	Labeled Items		Subject + Verb		Subject, verb + time/place		Complex Sentence or Details Beyond Picture	
Grade	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
JK	41	30	35	35	24	35	0	0
SK	46	23	26	41	19	27	7	9
Grade 1	5	5	39	27	50	26	6	42
Total	38	21	30	37	26	28	5	14

Words. Our *Spelling Stage* variable assisted us in understanding the meaning the child intended his or her chosen graphic form to represent, whereas the *Sentence Structure* variable considered the linguistic complexity of their intended message. For example, Jaeson printed "I P aD M H", which we coded as emergent *spelling stage* when he read back "I played at my house". Linguistically, we coded this as *subject + verb + time/place.*

When asked, most students explained their pictures, with a smaller number of children willing to write about their pictures. Children showed a range of differences between the content of their written and verbal responses. As expected, many children talked about their pictures with more complexity than they wrote yet this was the reverse with a few children. Sionna in SK serves as an example. Sionna verbally labeled items in her picture as "my mom", "that's my dad", "that's my sister", "Margie" and "that's my baby". She wrote "Itbg" and "IKlnbs", which she she read back as: "I clean dishes. I clean all the floor. I clean clothes. I eat my food. I eat hotdogs. I play a lot. I make flowers. I listen to my teacher. I listen Margie." We coded her written representation at the emergent spelling stage, and her written message included *subject + verb* content. It was unclear whether she thought her writing included only two sentences or all the sentences she conveyed.

Comparing the Term 3 overall intricacy of verbal and written explanations, SK children tended to communicate with similar levels of complexity. The non-Indigenous SK children tended to put slightly more complex content into their writing, tending toward including subject + verb and subject, verb + time/place phrases, with Indigenous children tending toward labeling and including subject + verb content. The JK children's written content tended toward less complexity and the Grade 1 children's written content tended toward more complexity (see Table 3).

Table 3

How students wrote about their pictures in Term 3 (as expressed in percentages)

Grade	Labeled Items	Subject + Verb	Subject, Verb + Time/Place	Complex Sentence or Details Beyond Picture
JK	58	18	12	12
SK	19	44	32	5
Grade 1	0	26	42	32
Total	23	34	30	13

In all grades and all terms, when the majority of children read back their writing, their message was directly related to what they wrote, with an exception in Term 3, when 45% of JK and 22% of SK Indigenous students ascribed a meaning to their writing that seemed unrelated to what they wrote.

Discussion

Our objective in this phase of the initiative was similar to that of Mackenzie et al. (2013) and Rowe and Wilson (2015) in that we focused on developing a framework for documenting nuances within young children's graphic representations with the aim of generating descriptors for teachers to use when recording their students' graphic activity. Rather than selecting participants from urban centres, we chose to work with an under-represented group of children, specifically, Indigenous and non-Indigenous children living in northern rural communities. Additionally, rather than focusing on one form of graphic representation, we invited children to respond in two different visual modes to a given task. Insights gained from our analyses will assist us in modifying the framework for use in the second phase of our initiative. However, relating these patterns to the rural and Indigenous context goes beyond the scope of this study.

By the end of the school year, our analyses suggest that participating children in all three grade levels were representing their given name in a linear fashion using the appropriate letters. Although the younger children's use of letter case and letter size was inconsistent across all three time points, we found that the Grade 1 children were writing their names conventionally by the end of the school year. Thus, overall, we found the children's ability to write their name improved with age, a finding that we suggest reflects a school-literacy practice within the classrooms and is consistent with past literacy research (e.g., Hildreth, 1936; Puranik & Lonigan, 2011).

When writing about their pictures early in the year, we found that, across all three age groups, the children who responded used a range of forms that included scribbling, letter-like forms, letters from their name, and letters. However, unlike in the name writing task, for many of the children, their use of appropriate letter case and letter size remained inconsistent. We suggest that, in terms of form, the young children were more advanced at writing their names than they were at writing individual words, a finding consistent with Levin et al. (2005).

Overall, we found our assessment framework made visible nuances within the children's writing. Our analyses suggest that, similar to findings in past literacy research

(e.g., Bear et al., 2008; Gombert & Fayol, 1992; Puranik & Lonigan, 2011), there exists a developmental pattern in young northern rural Indigenous and non-Indigenous children's spelling ability and in the linguistic content of their writing. Contrary to the belief that rural schools are failing to meet the literacy needs of young children (Jimerson, 2005; Stockard, 2011), we suggest the youngest children in our study were demonstrating abilities consistent with an emergent stage of spelling. Although many of the children represented salient sounds in words using single letters, we found that most lacked the concept of a word and demonstrated little letter-sound correspondence. We identified patterns within the older children's writing that suggest that, by the end of Grade 1, their abilities had progressed to the within word pattern stage. These children were able to spell most single-syllable and short vowel words conventionally. Our analyses further suggest that the complexity of the children's written messages increased with age, with Grade 1 children writing sentences with a subject, verb, and time/place information.

Overall, more children chose to draw than write. Based on our analysis, of the 100 children who responded to the drawing task in Term 3, 90 children also responded in print form, with 74 children from this group attempting letters or words. In contrast, all children, except one, responded to the prompt to draw a picture. This finding appears to support Landsmann and Karmiloff-Smith's (1992) suggestion that the graphic mode of drawing better affords young children the opportunity to represent and communicate meaning than does writing.

Our assessment framework also made visible nuances within the children's drawings. Although we found children in kindergarten tended initially to represent content in their pictures using scribbles or unidentifiable images, by the spring data collection, most of these younger children and all of the older children represented content by drawing identifiable images. This finding supports the developmental pattern described in past research (e.g., Kellogg, 1969/2015). Based on the elaboration we observed in the content of these drawings, we suggest that the children intended these images to represent characters and/or objects, a finding consistent with past sociocultural research (e.g., Coates, 2002; Cox, 2005).

Our analyses also suggest that, by the end of Grade 1, many of the children appeared to communicate relationships within their pictures through size and the intentional positioning of characters and/or objects within the picture and on the page (Lancaster, 2007). A look across variables revealed that the children showed size differences between characters (people and/or animals) whether they placed these characters in a straight line or positioned them randomly on the page. However, when the children randomly drew one character and one object on the page, we noticed that they tended to draw both items the same size. Almost all the children who grounded the items in their pictures tended to show size differences between at least some of the items. Of the students who "floated" items on the page, half showed size differences.

Finally, our analyses suggest that the complexity of the children's verbalizations was greater than the complexity of their graphical representations, with older children demonstrating greater complexity than younger ones. The children progressed from providing single word labels, to talking about their representations in single or multiple sentences, to providing details beyond what they appear to have represented graphically. Although the children's progression from single word labels to single or multiple sentences is consistent with Rowe and Wilson's (2015) research, their continued progression to

providing additional details is not. This suggests a need to further explore the children's language use during the administration of the tasks.

We acknowledge that, due to changes in our choice of tasks, the variation in the task administration, and incomplete administrator notes, during this phase of the study, our analysis was limited to generating frequencies in form, content, and message, as well as across grade levels and time points. However, since our research-based framework revealed patterns consistent with those found by literacy researchers working with young children in urban areas, we believe the tasks through which we generated the children's writing and drawing samples, and the variables and categories we used to analyze these samples, assisted us in identifying patterns in the northern and rural children's graphic representations. The insights we gained from these patterns will guide our research during the second phase of the initiative.

Future Research

In order to extend the research on young children's emergent writing and drawing, in Phase 2 of the initiative, we will adopt a mixed-methods design. Specifically, we will video record and transcribe the one-on-one interviews with the children. An analysis of the children's talk will assist us in confirming their intentions while representing and discerning patterns in how they use the verbal mode while representing graphically. We will also extend our analysis to better inform our understanding of how the children represent meaning graphically in their pictures and text. Consistency in our data collection methods will allow us to perform an in depth quantitative analysis of the variables including cross variable examinations. We anticipate findings from Phase 2 will better inform our understanding of the patterns in and relationships between the children's graphic representations and their talk. In keeping with the aim of the larger project, specifically assisting northern and rural educators as they support the oral and written language development of their Indigenous and non-Indigenous students, we look ahead to working collaboratively with educators to build a classroom tool that will assist them in understanding and communicating their students' learning.

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