

DEVELOPMENT OF OJIBWE (ANISHINAABEMOWIN) SPEECH

PHASE 1: DEVELOPING A WORD LIST TO EVALUATE SPEECH DEVELOPMENT

by

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BA, University of Saskatchewan, 2005

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF

THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE

in

THE FACULTY OF GRADUATE AND POSTDOCTORAL STUDIES

(Audiology and Speech Sciences)

THE UNIVERSITY OF BRITISH COLUMBIA

(Vancouver)

October 2014

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Abstract

First Nations children across Canada and the United States run the risk of being over-diagnosed or misdiagnosed for speech and/or language disorders due in part to a lack of knowledge about the culturally and linguistically relevant speech and language patterns of First Nations communities (Ball, Bernhardt, & Deby, 2007). Some children may speak a dialect of Ojibwe or a First Nations English Dialect influenced by Ojibwe and thus, speech-language pathologists (SLPs) and other educators need to ensure that each child receives linguistically and culturally suitable service. There are no linguistically and culturally relevant tools to assist in assessment and treatment of speech difficulties in Ojibwe-speaking children.

This paper provides the first phase in the creation of a tool for speech (phonological) analysis of single-word elicitations from children for the Odawa dialect of Ojibwe. The tool is built on nonlinear phonology, whereby all aspects of the phonological system are represented in a multi-tiered hierarchy allowing for the analysis of speech patterns of both consonants, vowels and their features plus syllable and word structures (Bernhardt, et al., 2010). This paper had two purposes: to better understand the phonological system of this dialect; and to create a word list that could be used to examine the speech development of Odawa-Ojibwe speaking children. The full Ojibwe word list (n = 90) consists of three word lists: a basic word list (with representation of most phonemes in all positions and word shapes); Extension A (with larger and more complex multisyllabic words); and Extension B (with smaller

words). The phonological data showed some patterns that do not occur in English (or in some dialects of Ojibwe) that SLPs and educators should be aware of when working with this language: vowel syncope, complex consonant clusters; prevalence of nasals; and a fortis/lenis distinction.

This paper provides the first phase in the development of an evaluation tool for use with Ojibwe-speaking children, and the template for other word list creations in other First Nations languages/dialects. The word list can be used clinically for descriptive purposes, though more research on use of this word list with children is needed.

Preface

The research for this thesis was planned and executed under the guidance of Dr. Barbara May Bernhardt, thesis supervisor. This qualitative study followed the phonological conventions established for the crosslinguistic study of phonological development, which is headed by Dr. Barbara May Bernhardt, and Dr. Joseph Stemberger of the University of British Columbia. The University of British Columbia Ethics board approved this study (UBC BREB certificate number H13-02862). This project required the contributions of the following people: language consultation with Ojibwe language speakers Gertie Manitowabi, Leland Bell, Mary Ann Corbiere, Margaret Young, and Stanley Peltier; recruitment of language speakers by Sharla Peltier; and editorial assistance by my supervisor Dr. Barbara May Bernhardt and my committee members Dr. Joseph Stemberger and Dr. Rose-Marie Déchaine.

For this thesis, my contributions included:

- 1) Research project design and submission of proposal for ethics clearance
- 2) Elicitation of data
- 3) Transcription and analysis of data and creation of word list
- 4) Writing of thesis and making corrections based on editorial comments of supervisory committee members.

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List of Abbreviations

3P-	3 rd Person marker
C-	consonant
CC-	consonant cluster
DIM-	diminutive morphology
FNED-	First Nations English Dialect
IPA-	International Phonetic Alphabet (International Phonetic Association, 1989)
NOM-	nominalizer morphology
PPD-	Protracted phonological development
PL-	plural morphology
S-	Strong (syllable with primary stress)
s.g.-	spread glottis
c.g.-	constricted glottis
SLP-	Speech-Language Pathologist
V-	vowel
VII-	Verb Inanimate Intransitive
w-	weak (unstressed syllable)
WI-	word-initial

WM- word-medial

WF- word-final

Glossary

Aboriginal Peoples - “include[s] persons of Indian, Inuit or Métis descent regardless of where they reside and whether or not their names appear on an official register” (Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, and Social Sciences and Humanities Research Council of Canada, 2013, p. 107).

Consultant/speaker - First Nations person whose first language is the Odawa dialect of Ojibwe and who participated in this project.

Community - In this research project, the community is a “community of interest”, rather than a community of specific location; that is, people who speak Anishinaabemowin (Ojibwe), and eventually, those for whom this research may benefit, most notably children in educational settings who speak Ojibwe or Ojibwe-influenced English (who may be referred for Speech-Language Pathology services), and those interested in the conservation and revitalization of the Ojibwe language.

Final# - reference number for a word from the broad transcription data in Phon

First Nations Peoples- “persons of Indian descent ... regardless of where they reside and whether or not their names appear on an official register” (adapted from Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, and Social Sciences and Humanities Research Council of Canada, 2013).

FNED - First Nations English Dialect: Variety of English spoken by some First Nations people. There is not one dialect, but each community may have its own distinct variety of English that is influenced by the First Nations language of that community.

Protracted phonological development -- sound system development that takes longer than is typical.

Standard English - Variant of English heard on national media, and taught in most school systems.

Acknowledgments

I wish to acknowledge my University of British Columbia thesis committee members, Dr. B. May Bernhardt (School of Audiology and Speech Sciences), supervisor, and Drs. Joseph P. Stemberger and Rose-Marie Déchaine (Department of Linguistics), for their patience and sharing of their knowledge on phonology, phonological transcription and First Nations language research.

A special thank you to Sharla Peltier and Stan Peltier for their hospitality and generosity during our stay in Northern Ontario.

I wish to acknowledge Leland Bell, Mary Ann Corbiere, Gertie Manitowabi, Stanley Peltier, and Margaret Young for their expertise on the Odawa dialect of Ojibwe. Without their knowledge this project would not have been possible.

I wish to acknowledge the Social Sciences and Humanities Research Council (SSHRC) for the generous student grant that made this research financially possible.

Finally I wish to acknowledge my friends and family for pushing me to completion and guiding me when I needed it most.

Dedication

This thesis is dedicated to the Ojibwe language consultants Leland Bell, Mary Ann Corbiere, Gertie Manitowabi, Stanley Peltier, and Margaret Young. Without your valuable insight and assistance in creating this word list, this thesis would not have been possible.

Dedication also goes out to Sharla Peltier for your organization of consultants and for your knowledge of First Nations culture, without which we would have been lost.

Chapter 1: Introduction

1.1 Synopsis of Study and Outline

Across North America, Speech-Language Pathologists (SLPs) work with First Nations children in a variety of clinical settings. However, research has suggested that Aboriginal children, speaking either a First Nations Language or a First Nations English dialect, are often over-diagnosed or misdiagnosed for speech and language disorders (Ball et al. 2007). One of the contributing factors to over- and mis-diagnosis of speech and language disorders in First Nations children is the lack of resources and knowledge related to the First Nations languages and dialects being acquired by children. This thesis will study the speech patterns found in one dialect of Ojibwe (Odawa). Through collaboration with Odawa-Ojibwe speakers, the author will present a word list that could inform speech-language pathologists (SLPs) and other educators about speech sounds in this dialect¹. This would enable comparisons of the child-client's sound system with the sound system typical of this dialect of Ojibwe.

The thesis begins with a literature review, including the current state of research in the area of First Nations language acquisition and information on current language revitalization programs. Then it

¹ My history in the research of Algonquian languages began as an undergraduate research assistant working on Plains Cree in the UBC Department of Linguistics. I worked directly with a Cree language consultant for a majority of those two years studying the syntax and morphology of the language. My training in both Cree, and minorily in Blackfoot, has informed many of the decisions made for this thesis; this training informed my knowledge of Ojibwe as a member of the Algonquian language family.

describes the current state of phonological knowledge on Ojibwe and the Odawa dialect followed by a brief introduction to the theory that serves as the foundation of this thesis, nonlinear phonology. The body of this overview discusses the steps taken to answer the following questions: (1) what does an initial glimpse into the phonology of this dialect of Ojibwe look like and how do we account for variability amongst speakers; and (2) how do you decide what is a suitable word list for examination of children's speech development in the Odawa dialect of Ojibwe? This is followed by the results of our research, a discussion of the results, and appendices.

1.2 Literature Review

The study of First Nations Languages is important for the documentation of the languages and for the future viability of the languages. Based on research by Kinkade (1991) Ojibwe, Cree and Inuktitut are Canada's three viable First Nations languages. This means that these languages, due to their large population bases, are likely to survive in the long term. A 2006 Census indicated that over 24,000 people speak Ojibwe (Statistics Canada, 2006) as a first language and Census 2001 (Statistics Canada, 2003) indicated that almost 8000 people were also learning Ojibwe as a second language. These facts and the fact that the Ojibwe language is being revitalized are reasons for continued study of the language from a clinical perspective. A large population of speakers may also translate into more children that speak Ojibwe as a first or second language, or speak an Ojibwe-influenced English dialect, being seen by SLPs in schools and pediatric settings.

1.2.1 Status of First Nations child language study

In order to work effectively with children of First Nations, Métis or Inuit heritage, SLPs and educators require knowledge and training in the cultures and languages of these peoples in Canada. A review of the literature, however, reveals limited research related to the study of the patterns of child speech and language acquisition of First Nations languages in North America, to date. A literature search has revealed research on acquisition of Northern East Cree, Oji-Cree, Chilcotin, Chipewyan, and Inuktitut, for example: Northern East Cree (Rose & Brittain; 2011; Swain, 2008; Terry, 2009; Thornburn, 2014); Oji-Cree (Hack & Mellow, 2007; Zabala & Mellow, 2007); Cree (Mellow, 1989); Chilcotin (Pye, 1992); Chipewyan (Cook, 1995); and Inuktitut (Allen, 1996; Allen & Crago, 1996; Allen & Crago, 2001; Beddard, Cleave, Dench, & Tagak, 2011).

Most of the studies mentioned are descriptive in relation to the acquisition of the language being studied. While this is valuable information for the SLP, research that presents culturally relevant tools for clinical work would prove invaluable. There is some research being conducted on Cree and Inuktitut that is SLP-focused. The Chisasibi Child Language Acquisition Study (Brittain, Dyck, Rose, & MacKensie, 2014) at Memorial University, whose researchers have done considerable work on Northern East Cree, have, along with two SLPs, recently released a Resonance Screening tool that is designed for Cree-speaking children (Brittain, Erdos, & Woolridge, 2014). This tool has 94 targets, with some words repeated more than once. Although geared to identification of difficulties of resonance (the control of

air flow through the oral or nasal cavity), this tool provides a list of words for pronunciation in Cree, targeting consonants and consonant clusters in word-initial (WI), word-medial (WM), and word-final (WF) positions. However, it only contains short words (minimal number of syllables) and very few nasals. Another study, by Beddard, Cleave, Dench and Tagak (2011), discusses the creation of an English-Inuktitut speech and language screener that is being used in Iqaluit. One component of the tool focuses briefly on phonology but also includes screening for language comprehension and syntax.

Although there appears to be an increase in research on other languages, there remains no published research to date on acquisition of the Odawa dialect of Ojibwe, despite the fact that Ojibwe has one of the largest indigenous language populations in Canada (Statistics Canada, 2006). There has been some preliminary research on how to make SLP services relevant to First Nations clients (Peltier, 2011). Based on her experiences as an Anishinaabe woman working in the same area of northern Ontario where these thesis data were collected, Peltier discusses some of the grammatical and phonological features found in the First Nations English dialect (FNED) of this community. In the descriptions of phonological features in the literature and in the data set used in this thesis, the International Phonetic Alphabet (IPA, 1989) will be used. Peltier notes that FNED does not contain /f, v, θ, ɹ, l/ and that there is a lack of a simple contrast between voiceless and voiced stops and affricates (e.g. /p-b/, /t-d/, /k-g/, /tʃ-dʒ/), and sibilants /s-ʃ-z/. Children may therefore show interchanges of the

above pairs, or substitute certain speech sounds, e.g. [p] for /f/, [v] for /b/, [n] for /ɪ/, [w] for /l/ (Peltier, 2011).

In addition to describing the dialect, Peltier offers her experiences and approach to working with children who speak an FNED. Most notably, she recommends that SLPs approach working with First Nations clients with “a culturally sensitive lens” to better establish relationships with the community and our clients and that the field needs to create more culturally sensitive evaluation methods to better serve this population (Peltier, 2011). As the next section discusses, there is a revitalization of First Nations Languages in North America, and Ojibwe is one of those languages. As Ojibwe becomes more widely used, understanding the speech and language characteristics of the Ojibwe FNEDs and the dialects of the Ojibwe language will become more important for the appropriate treatment of a growing base of clients.

1.2.2 Language revitalization

Across Canada, there is an increasing interest in the revitalization of First Nations languages. For example, the First People’s Cultural Council’s mandate is “to support the revitalization of Aboriginal language, arts, and culture in British Columbia” (First People's Cultural Council, 2013). Their language initiative, First Voices (www.firstvoices.com), has representation from several languages across the country. In Ontario there are initiatives for Ojibwe that have focused on learning and have published a number of excellent resources for vocabulary and digital recordings for language learning.

For example there are “The Revitalization of the Nishnaabemwin Language Project” (Trent University Native Studies Department) and the Wikwemikong Heritage Organization (Wikwemikong Heritage Organization, 2014). In Minnesota, USA, the Ojibwe People’s Dictionary (the Ojibwe People's Dictionary, 2014) has also been created as part of the revitalization effort. Speakers of Ojibwe are committed to disseminating Ojibwe language and culture to others, especially the new generation of speakers (the Ojibwe People's Dictionary, 2014).

As part of the language conservation effort, materials have been created for teaching children and others interested in strengthening or learning the language (Wikwemikong Heritage Organization, 2014). These materials include the books and CDs used in part to create the preliminary word lists for this thesis project. Research has also been conducted on the use of technology in the home for Ojibwe language learning through a program called Ojibwemodaa (Hermes & King, 2013). The aforementioned resources indicate that Ojibwe language learning is present in North America. With an increase in language learners and people who speak Ojibwe, SLPs are likely going to be asked to assess or provide treatment for children of Ojibwe language and culture and it is essential that we have the culturally sensitive and linguistically relevant tools to do so.

1.2.3 Overview of nonlinear phonology

A major theoretical basis for this study is nonlinear phonology, the “hierarchical representation of phonological form from the prosodic phrase to the individual feature” (Bernhardt, Bopp, Daudlin,

Edwards, & Wastie, 2010, p. 315). This means that it is not simply the features of individual consonants and vowels that contribute to the phonology of a word but also the simultaneous interaction of those features, word stress, syllabic structure, word length and pitch or tone of that particular word (Bernhardt, et al., 2010). For example, a word like *thesis* in English is composed of a number of layers: the individual phonemes (e.g. /θ/, /i/, /s/, /ɪ/, /s/) and their respective features of place, manner of articulation (e.g. /θ/ is [Coronal,-grooved] [+spread glottis, -voiced], and [+continuant]-[-sonorant]); it has two syllables with Strong-weak (Sw) word stress and a 'CV.CVC wordshape consisting of five phonemes. Figures one and two show the hierarchical tiers for the word “thesis” /θi.sɪs/.

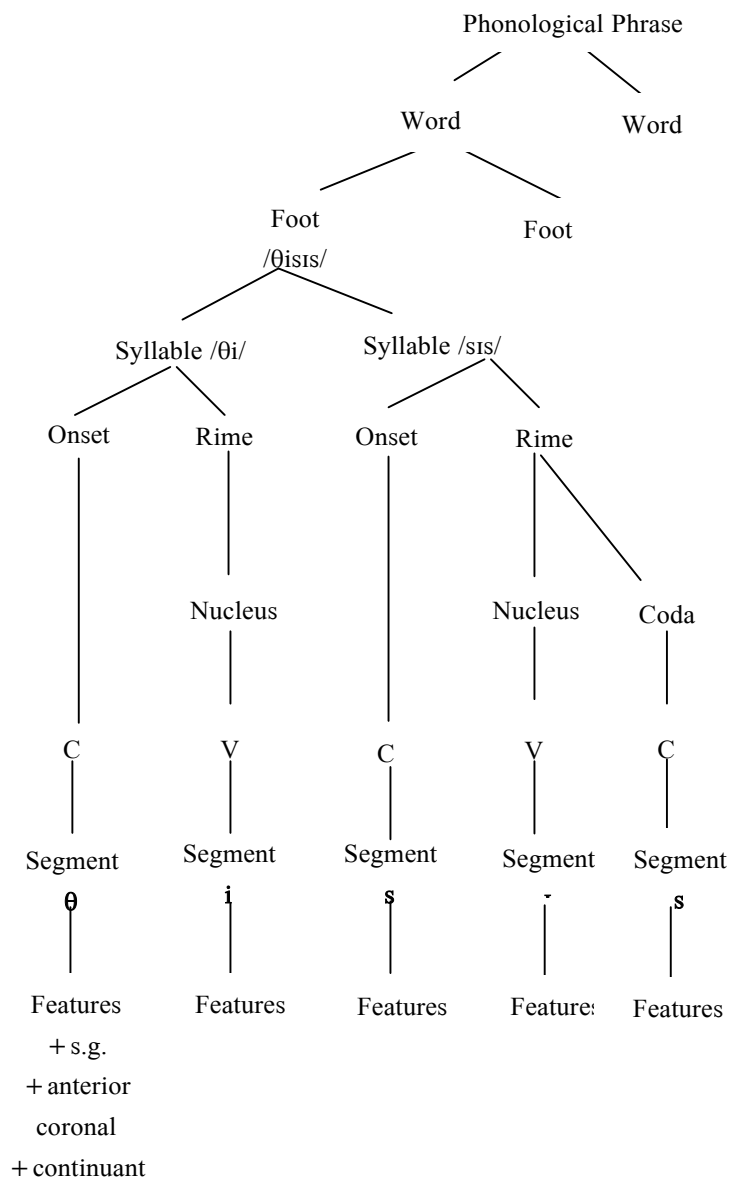


Figure 1: Phonological Hierarchy for /θi.sɪs/ (based on Bernhardt & Stemberger, 1998)

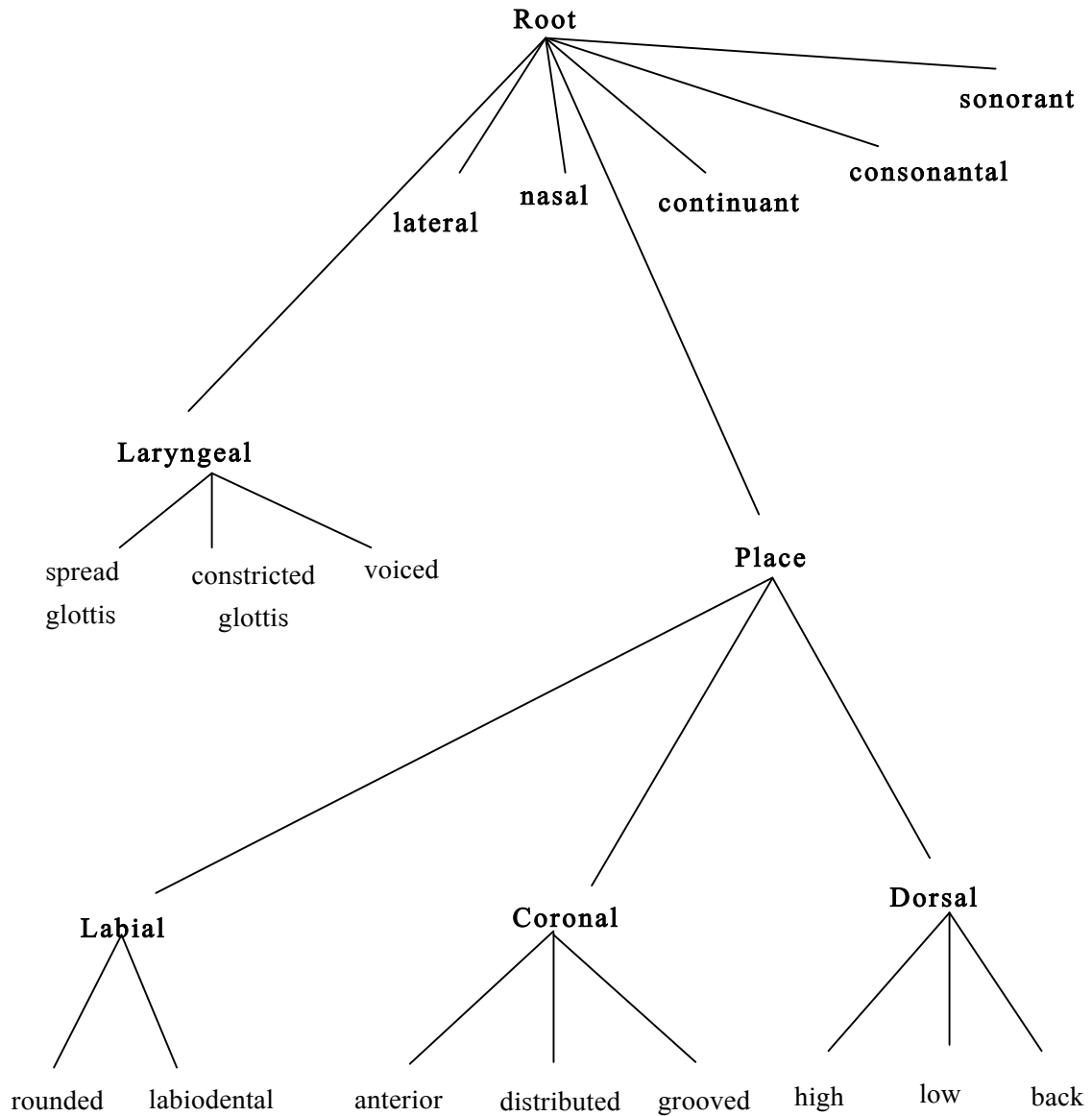


Figure 2: Segmental Hierarchy (based on Bernhardt & Stemberger, 1998)

The word *thesis* contains many levels of representation, and when a child has difficulty with one or more of those levels of the phonological hierarchy, something(s) will have to be sacrificed. For example, if a young child is only capable of producing monosyllabic words, one of the syllables would have to be dropped. If a typically developing child is at the one-syllable stage, they likely also will not have a /θ/ ('th') or even /s/ in their phonetic inventory and so one might expect a one-syllable production to sound like *tea*. The interaction between the different phonological levels is integral to understanding and treating children with protracted phonological development (PPD). For more information regarding nonlinear phonology and its application to acquisition data, consult the *Handbook of Phonological Development from the Perspective of Constraint-Based Nonlinear Phonology* by Bernhardt and Stemberger (1998).

This thesis took into consideration each of the phonological tiers when creating the word list, in so much as the limited research on the phonology of this dialect of Ojibwe and the data from this research would allow. While nonlinear phonology provides the rationale for this type of evaluative tool, an understanding of Ojibwe phonology is necessary to understand which words were actually selected.

1.3 Ojibwe Phonology

The following is a brief overview of Ojibwe phonology. As most of the research has focused on dialects other than Odawa, this is a general review of Ojibwe phonology. Where there is information specific to the Odawa dialect of Ojibwe, this is noted explicitly. For a dialect survey of Ojibwe

language, see Valentine (1994). Where symbols from the literature do not match the IPA symbols used within this thesis, the differences are discussed. Vowels, consonants and consonant clusters, stress, pitch, word shapes and syllable structure are presented below as has been presented in the literature and gaps in knowledge are noted.

1.3.1 Vowels

Based on a survey of the literature on Ojibwe phonology, Ojibwe, in general, has three short vowels, four long vowels, and four nasal vowels (Nichols & Nyholm, 1995; Rhodes, 1985; Valentine, 1994, 1996, 2001) as shown below in Table 1². The three short vowels are often written orthographically as *i*, *a*, and *o* and their phonetic realizations are respectively [ɪ]~[ɛ]~[i], [ʌ]~[ə]~[ɛ]~[ɪ]~[o]~[ɑ], and [o]~[ʊ]~[ʌ]~[ə]. The four long vowels are often written orthographically as *ii*, *e³*, *oo*, and *aa*. The phonetic transcriptions for these characters are [i:], [e:]~[ɛ:]~[æ:], [o:]~[u:], and [ɑ:]~[ɔ:]~[ɒ:] respectively. The [ɑ:] has been written as [a:] in the literature but it is the symbol for the low-back vowel sound like in the word *father* in Canadian English. For this thesis it is written as [ɑ:]. For more information on Ojibwe vowel allophony refer to Rhodes (1985).

² The height contrast among long front vowels is high vs. nonhigh, while the contrast among back and central vowels is low vs. nonlow. This is simplified in Table 1 by using the label “high” to refer to the higher vowel and “low” to refer to the lower vowel.

³ *e* is not written as a double vowel, for example *ee*, as there is no short counterpart (Valentine, 1994)

	Short Vowels			Long Vowels					
	Front	Mid & Back		Front			Back		
High	i	o	u	i:			o:	u:	
Low		ə	ʌ	ɔ	e:	ɛ:	æ:	ɑ:	ɒ:

Table 1: Non-Nasal Vowel Inventory in Ojibwe

As mentioned above, Ojibwe also has contrastively nasalized vowels. According to Nichols and Nyholm (1995), the orthography identifies these as a vowel followed by */-nh/*. The following examples

(1) through (4) present the orthographic and phonetic equivalents for the nasal vowels:

aanh /ã:/
 (1) *memegwaan*
 me-megw-aanh
 RED-butterfly-NOM
 mɛ.mɛ.ˈgwã:
 ‘butterfly’ (Final68)

enh /ɛ̃:/~ /ɛ̃h:/
 (2) *bagwaakwen*
 bagwaakw-enh
 chicken-DIM
 ˈbɑ:.kɑ:.kwɛ̃:
 ‘chicken’ (Final49)

iinh /ĩ:/
 (3) *waabganoojiinh*
 waabganoo-jiinh
 mouse-DIM
 ˈwɑ:.bə.gə.ˈno:.ʤĩ:
 ‘mouse’ (Final48)

oonh /ô:/~/û:/
 (4) *giigoonh*
 giigo-onh
 fish-DIM
 'gi:gõ:
 'fish' (Final56)

In addition to the nasalized vowels, there are also certain contexts where vowels become allophonically nasalized: before *ns*, *nz*, and *nzh*; long vowels after the nasal consonants *m* and *n*, especially when they precede *s*, *sh*, *z*, or *zh*.

1.3.2 Consonants

Unlike the English voiced and voiceless distinction, non-nasal consonants in Ojibwe have a lenis (weak) and fortis (strong) distinction. A brief introduction to these concepts is important to better understand the consonant system. According to Ladefoged and Maddieson (1996), the two terms have to do with the amount of “energy” that is used to produce the sounds. Fortis sounds have been characterized to have either increased respiratory energy or greater articulatory energy than their lenis counterparts⁴. Fortis consonants “do not occur at the beginning of words (unless a vowel is left off), may sound long or double, and are voiceless,” while lenis consonants “can occur at the beginning of words and are often voiced, especially in the middle of words” (Nichols & Nyholm, 1995, p. xxvi). This

⁴ Alternatively, one could say that fortis consonants tend to be hyperarticulated (and so are not very variable), while lenis consonants are often underarticulated (and so are more variable in manner of articulation and voicing).

means that in a dialect with vowel syncope, like the Odawa dialect, the vowels that are “left off” at the beginning of words reveal consonants that have historically had a fortis/lenis contrast. In the Odawa dialect, there are examples of fortis consonants at the beginning of words. Table 2 presents the consonant inventory of Ojibwe adapted from Nichols and Nyholm (1995) using the IPA symbols that are used in this thesis.

Manner	Fortis/Lenis	Labial	Alveolar	Palatal	Velar	Glottal
Stops and Affricates	Fortis	p(:) ^h	t(:) ^h	tʃ(:)	k(:) ^h	
	Lenis	b p	d t	dʒ tʃ	g k	
Sibilants	Fortis		s	ʃ		
	Lenis		z	ʒ		
Nasals		m	n			
Other Sounds		w		j		* ?

Table 2: Consonant Inventory in Ojibwe as Found in the Literature

*Nichols and Nyholm (1995) have /h/ as a phoneme in their table. Our data marks glottal stops but treats “[h]” as either preaspiration, aspiration in fortis stops, or word-initial or word-final devoicing (which yields an [h]-like percept). We have no words in our sample with phonemic /h/ targets.

1.3.2.1 Consonant clusters

Nichols and Nyholm (1995) list the following as consonant clusters in Ojibwe:

sk	/sk/	shp	/ʃp/
sht	/ʃt/	shk	/ʃk/
mb	/mb/	nd	/nd/
nj	/ndʒ/	ng	/ŋg/

After /s/ or /ʃ/, /k/ /p/ and /t/ are pronounced with less force and duration, and without aspiration. The

/w/ is a glide that exists both on its own and in a cluster. Valentine (1994), identified the following

CwV combinations for Ojibwe: *gwa*, *gwii*, *gwe*, *gwaa*, *dwa*, and *bwaa*. These statements are based on dialects without much vowel deletion historically and/or cross-dialectal research as in the case of Valentine (1994). In the Odawa dialect, there are a lot more consonant clusters due to the process of vowel syncope, which deletes weak vowels, including those that occur between consonants.

1.3.3 Word length and word shape

A literature search revealed no studies of word length and word shape. However, based on the words compiled for this thesis, the smallest word shape consists of a one syllable CVV structure and words can be longer than six syllables, though for the purposes of this project, the longest word has five syllables. According to Valentine (1994), most syllables in Ojibwe are V, CV, or CVC; however, patterns such as vowel syncope (discussed below) do create some consonant clusters, as the thesis data will show. Word shape and length will be discussed in more detail in the results section.

1.3.4 Stress

Valentine (1994) states “syllables are grouped into quantity-sensitive, iambic binary feet, starting from the left edge of the phonological word” (p. 143). This means that long vowels are stressed and weak vowels are not. Additionally, the final syllable is always strong. This would result in a pattern such as wS.wS.S for a three-syllable word for example. In the Odawa dialect of Ojibwe however, stress is more complex due to the process of vowel syncope wherein metrically weak vowels may be deleted. For example, in the word shape (CV.CV).(CV.CV), the first and third vowels are considered metrically

weak, if we follow the left-to-right iambic binary pattern. This would result in a word with a shape like (CCV.CCV) with two stressed syllables, requiring us to determine which syllable has primary stress and which secondary. Valentine (2001) states that the basic rule for determining the primary stress in a word is to “give main stress to the strong syllable in the third foot counting back from the [right] edge of the word” (p. 55), and if the word has less than three syllables, the first stressed syllable is given the main stress. This becomes more complex with speaker variation as is discussed later on in the thesis. It is not clear to the nonnative listener whether all of the syllables that “should” have secondary stress actually do, and we do not transcribe all such syllables with stress; and primary stress is sometimes clearly on medial or final syllables. With nonlinear phonological theory and Ojibwe phonology as a background, this thesis will turn to the application of these two concepts in the creation of the initial working word list that was used for data elicitation.

1.4 Creation of a Word List for Phonological Elicitation

One of the major objectives for this thesis was the creation of an Ojibwe word list for speech evaluation. The use of a single-word elicitation task in conjunction with a connected speech sample is recommended in order to derive a complete picture of a child’s phonology (American Speech-Language-Hearing Association, 2014; Stoel-Gammon & Williams, 2013). The American Speech-Language-Hearing Association states that single word testing “provides identifiable units of production and allows all sounds in the language to be elicited in a number of contexts” but that productions in

single-word elicitation may not be the same as productions in connected speech (American Speech-Language-Hearing Association, <http://www.asha.org/Practice-Portal/Clinical-Topics/Articulation-and-Phonology/>, 2014).

Single-word production tests do provide valuable phonological information and have been shown to provide a fairly accurate representation of the types of productions a child may make (Olsen, 2010). This thesis will utilize a single-word elicitation task because these tasks are able to provide SLPs with enough information to decide whether a full evaluation with a connected speech sample is warranted, or can also be used in conjunction with a connected speech sample elicitation.

There are a number of factors that should be considered in the development of a phonological evaluation tool. Ideally, it would be useful to have an idea of the acquisition of phonology and the vocabulary that is typically known for the language, which is impossible due to a lack of research in this area for Ojibwe. There are other aspects that can be taken into account when choosing the word list. In their creation of a motor speech assessment tool for connected speech, Connaghan and Patel (2014) discuss two considerations when creating an assessment tool that also apply to the creation of single-word elicitation tasks. Firstly, as they and other researchers have suggested, it is very important that the tool be culturally sensitive and appropriate (Beddard et al., 2011; Connaghan & Patel, 2014; Peltier, 2011). Secondly, it is important that the words selected are representative of not just the consonants and vowels of the language, but of the entire phonological hierarchy, i.e., the word shapes, syllables, feet,

stress patterns and other word structures (Bérubé, Bernhardt, & Stemberger, 2013). This topic is discussed further in Chapter 2 (Methodology). It is important to keep in mind that the word list is intended to ultimately be used with children that are acquiring language. The words chosen should be easily depicted by photograph/image or through the use of a physical object. In addition, the word list should contain words that children would be familiar with and are more likely to use in their everyday conversations.

1.5 Research Questions

One major purpose of this study was to learn more about the phonology of the Odawa dialect of Ojibwe spoken in the Northern Ontario community in which the data were collected and the second was to create a tool that could be used by SLPs when evaluating the speech production of children from communities that speak this dialect. As mentioned previously, there is a dearth of research in the area of Ojibwe phonological development and no up-to-date information on the phonological inventories of the Odawa dialect (in terms of word structure, consonants and vowels). Thus there were two major research questions:

1) What are the major phonological characteristics of the Odawa dialect in terms of word structure and segments? Secondly, what is the range of across-speaker variability for various words, because this variability could also appear in child productions?

This question was to be addressed through discussion with and audio recording of native speaker consultants in Ontario.

2) What words and pictures are both socially and phonologically suitable for a word list for evaluating the speech of Ojibwe-speaking children, phonological suitability determined by the research team, and social suitability, being addressed through discussion with native speaker consultants regarding:

- a) The targeted age range of the clients (preschool and early school-aged children)
- b) The cultural suitability and relevance of the selected words
- c) The familiarity of the words to young children; and
- d) The images selected for eliciting the words.

This paper addresses the creation of the preliminary working list based on basic principles of nonlinear phonology and the process for the selection of the final word list through discussion with consultants to create a word list that would be relevant to child speakers.

Chapter 2: Methodology

The method comprises four subsections, each illustrating one aspect of the project. Within each subsection is a description of the methods that were employed for the completion of that aspect of the project. The subsections are as follows: creation of the word list; elicitation of the word list from consultants; transcription of tokens; and selection and organization of the tokens into (a) word list(s).

2.1 Creation of the “Working” Word List

This study is part of a larger crosslinguistic project, which has involved innumerable partners in the study of speech patterns in children in 14 countries (Bernhardt & Stemberger, 2010). The Ojibwe project has followed the guidelines of the general project. The creation of the Ojibwe word list and evaluation procedures are, in part, modelled after Bérubé et al. (2013). While the preliminary word list for this project was used to elicit tokens from adult speakers, the words were chosen with children between the ages of 3 to 6 years in mind, because the end goal of the Ojibwe project is to create a speech evaluation tool that can be used with children.

The choice of preliminary words used for this project followed the principles and practices of Bérubé and Stemberger (2010) for Canadian (Manitoba) French:

- 1) Selection of 80-100 words that represent the phonology of the language.

- 2) Inclusion of all consonants and vowel sounds across word positions with the full range of place, manner and laryngeal features, with the objective of two examples, minimum, of each consonant across word positions (WI, WM, WF).
- 3) Inclusion of words of various lengths, shapes, stress, and sequences of different places and manners across consonants separated by vowels (e.g. Labial - Labial, Labial - Dorsal, [-continuant] - [+continuant]).
- 4) Choice of simple vocabulary items that are age and culturally suitable (targeted at children between 3-6 years of ages from the Odawa-Ojibwe speaker group). The preliminary words were gathered from the Wikwemikong Heritage Organization language resource materials (Bell, 2007; Eshkawkogan, 2006; Wikwemikong Heritage Organization, 2004; Wikwemikong Heritage Organization & Wikwemikong Public Library, 2006).
- 5) Selection of culturally relevant public-domain pictures or objects. This was done through a web search and selection of simple images/pictures/drawings based on the word list and in consultation with a member of the team.
- 6) Sorting of the words into categories/themes for elicitation: shapes and numbers; animals; people and body parts; land, food, clothes, and other objects.

- 7) Printing off a paper copy of these pictures (two per page) and saving a copy of this as a PDF for use on a digital device (in this case, iPad3). The iPad3 was the display of choice for elicitation of the words for this project, with the paper copy as a back-up.

2.2 Data Elicitation

The data for this thesis were collected in a northern Ontario community with speakers of the Odawa dialect of Ojibwe. The author, Anne-Marie Kidd, and the thesis supervisor, Barbara May Bernhardt, traveled to the northern Ontario community to meet with the consultants and to collect data with these consultants on the working word list.

2.2.1 Participants

Five Adult Anishinaabe speakers were recruited as consultants with the assistance of Sharla Peltier, an Anishinaabe SLP and researcher in the community in Northern Ontario in which we collected the data. Ms. Peltier provided potential consultants in the area with the written information and consent form approved by UBC's Behavioural Research Ethics Board and discussed the project with them in person or on the telephone if they indicated interest. If they agreed to meet with the researchers, further formal consent was obtained as is discussed below under Procedures. All who agreed to meet the researchers agreed to participate. The following people, in alphabetical order, are the Ojibwe language-

speaking consultants that participated in this project: Leland Bell, Mary Ann Corbiere, Gertie Manitowabi, Stanley Peltier, and Margaret Young.⁵

2.2.2 Procedures

Word list consultations were between 2 to 3 hours from start to finish and took place in the consultants' homes. For each consultant, the following steps were taken during that time period.

2.2.2.1 Informed written consent

After the initial greetings and conversation (and tobacco offerings, when done), speakers were handed the informed consent papers to read to themselves or to follow along as the author explained the purpose of our visit. The speakers were asked whether, now that they were re-informed about the project, they still wanted to sign the forms to confirm their participation in the project. All agreed.

2.2.2.2 Data collection

Data were audio-recorded with the equipment discussed in the materials section. Consultants were presented with digital picture representations of the words from the working word list one at a time on the digital display and were instructed to say the word, followed by a sentence using the word, and then the word again. The sentence production provided the author with the most naturalistic production of the word by which to compare the words spoken in isolation (one of which was selected for transcription). Consultants were also asked to provide their opinions on word selection, give

⁵ All consultants who participated in this project wished to be acknowledged by name.

alternative pronunciations/words if they existed in their vocabulary, notify us if they did not have a word for a particular pictured object or concept and comment as they wished on the pictures themselves.

2.2.2.2.1 Materials

For audio-recording the sessions, a high quality digital tape recorder was used: an M-Audio Microtrack II with associated Sennheiser ew 100 G2 remote system supporting a Countryman ISOMAX microphone. Back-up recordings were also made with an iPhone 5. The iPhone5 has a system that is designed to eliminate background noises and record sound from all directions in a wide frequency range. The recorded files were compressed into an .MP4 format. While file compression may not allow the listener to capture all of the phonological details (Daniel, 2012; Oster, n.d.) there were technical difficulties with the main recorder during some sessions, which required that the iPhone 5 recordings be used. Additional materials included a research computer for storing the digital audio-recordings, an electronic (iPad3) and paper version of pictures of words in the working word list. (See Appendix A for the full working word list.)

2.2.2.2.2 Tobacco offering

It was after the first consultation that we learned from our hosts about the use of tobacco offerings as a cultural norm when working with First Nations individuals in the community. We were unable to find the right type of tobacco for offerings in time for the third visit, and thus were unable to provide the third consultant with an offering.

To prepare the tobacco offerings, loose tobacco was placed into the center of a square of fabric. Sage and sweet-grass were lit and the offering and the researchers were smudged. During the smudging, positive thoughts for the meeting and good intentions were put into the tobacco offering as well as reinforced within the author's mind. Once smudged, the tobacco was tied into a bundle to be given to the speakers.

Prior to obtaining informed consent from the speakers, an offering of tobacco was given to all but the first and third speakers. The process for this involved laying the prepared tobacco sachet on the table next to the consultant, asking the speaker if s/he would be willing to work with us on this language project and briefly discussing what it would entail. If the speaker picked up the offering in their hand, it was taken to mean that they agreed to have this meeting go forward. All consultants who were given tobacco offerings accepted the tobacco offerings.

2.2.2.3 Compensation

Consultants were thanked for their participation and provided remunerations of \$50.00 per hour for their consultative language services.

2.3 Transcription and Data Analysis

Once the data were collected, they were transferred to a password-protected back-up drive and computer, deleted from the recording devices, and stored in the supervisor's speech laboratory at the university. The sound files were linked to Phon 1.6.2 (Rose & MacWhinney, 2014) and word list

templates created. (Phon is a program used for word segmentation and phonological transcription and analysis.) Speaker comments regarding the word list were noted on a spreadsheet and are discussed in the results section of the thesis.

During elicitation, speakers were asked to provide two productions of each word. If speaker productions of the words were both very similar to the word in the sentence, one token from each word was selected for transcription. If productions of the same word differed greatly or an alternative word was suggested, those words were also selected for transcription. In cases where only one production was recorded, that production was transcribed. Any words that consultants suggested as possible test words and were not on the word list were also selected for transcription.

Before a complete transcription was conducted, the author selected 19 words from each consultant to be transcribed by both the author and a supervisory committee member, who is familiar with Ojibwe and highly experienced in transcription. Each researcher transcribed the words separately and then met together to discuss transcription conventions. The following areas of transcription conventions were discussed and a set of transcription guidelines established for the purposes of this project. Further differences between speakers are discussed in the results section of this thesis. For the purposes of this project, the author elected to do a relatively narrow transcription at her current level of transcription training, in order to capture the variations between speakers.

2.3.1 Pitch

There was variation between the five speakers in terms of pitch. For example, one monosyllabic word had productions of flat-, rising-, or level-pitch across the five speakers. Due to a lack of pitch agreement across speakers, it is difficult at this time to establish patterns of pitch use within this dialect of Ojibwe that could be reliably tested in child productions. As such, the team has decided to not include pitch markings in the transcriptions at this time.

2.3.2 Stress

As noted in the introduction, there are some dialects of Ojibwe known in the literature to have a tendency to delete short vowels, which can affect stress patterns (Valentine, 1994; 1996). Vowel syncope did not appear to occur across the board with our consultants, but was common, and may also have within-speaker variation. Because of the loss of unstressed syllables, it is difficult to generalize stress patterns across speakers and in the target forms for future child speech evaluation. However, the author has elected to mark primary stress (ˈ) when possible.

2.3.3 Consonant variation

The sample transcriptions revealed variation in obstruents and nasals. These two areas of consonant variation are discussed next.

2.3.3.1 Fortis vs lenis distinction

As discussed in the introduction, Ojibwe has a distinction between fortis and lenis consonants, related to (but different from) the voiced and voiceless consonant distinction found in English. When looking through narrow transcription of the word set, variations of the lenis consonants were noted in three forms for the obstruents: voiced (e.g. [b]); devoiced (e.g. [b̥]); and unaspirated voiceless (e.g. [p]). It should also be noted that there were examples of a voiced fricative [ɣ] as the realization of the lenis stop /g/. Lavoie (2001) discusses how in many languages, segment realization is flexible and that a stop may not necessarily be realized as such. For the purpose of this paper, this process will be referred to as *consonant lenition* and is exemplified in (5).

- (5) *zhgaak*
zhgaak
skunk
ɑ.ˈɣɑ:k^h
'skunk' (5-90)

The allophonic variants for the stops will be broadly transcribed in the final word list as /b/ for example, and the fortis counterpart as /p/. In the results section, consonant variations between speakers are discussed in detail and a broad transcription of the final target is presented for the word list where possible. Appendix B presents the list of narrowly transcribed productions⁶, which includes all words

⁶ After establishing transcription guidelines, narrow transcriptions were completed to the best of the author's knowledge of transcription.

that were elicited and selected as possible candidates for the final word list. Table 3 below indicates the allophonic variants of lenis and fortis consonants that were found in our initial transcription comparison and how they were transcribed by the author in the narrow data set.

Allophonic Variants (Lenis)			Transcription (Lenis)	Allophonic Variants (Fortis)		Transcription (Fortis)
b	b̥	p	b	p ^h		p
d	d̥	t	d	t ^h		t
g	g̥	k	g	k ^x	k ^h	k
ʒ	ʒ̥	ʃ	ʒ	ʃ:		ʃ
z	z̥	-	z	s:		s

Table 3: Fortis/Lenis Variants

2.3.3.2 Nasal variation

There was some variation across and within speakers in the production of WI /m/ in consonant clusters. In some cases, /m/ was pronounced as a stop, [p], before fortis obstruents; [p] and [m] were thus transcribed as alternatives for the same words. This is shown in examples (6) and (7) below.

(6) *mskwaa*
 msk-waa
 red-VII
 'pskwa:
 'red' (4-22)

(7) *mskwaa*
 msk-waa
 red-VII
 'mskwa:
 'red' (3-22)

There was some variability on productions of the nasal /n/, where the nasal was deleted entirely before fortis obstruents. Variations for the production of *nswi* and how they were transcribed are shown below in examples (8) and (9).

(8) *nswi*
nswi
three
'ns:wε^h
'three' (3-7)

(9) *nswi*
nswi
three
's:we
'three' (2-6)

2.3.4 Vowels

There were a few areas where vowel transcription needed to be discussed: nasalization of vowels next to realized nasals and in isolation; and the occurrence of suspected allophonic variants of vowels.

2.3.4.1 Nasalization

As discussed in the introduction, Ojibwe has a series of nasal vowels that in the orthography are written as *Vnh*. In addition vowels are often nasalized between nasal consonants and sometimes before or after a single nasal that appear to be allophonic variants typical in the adult productions in this sample. This thesis marks only the nasalization where there is no nasal consonant contiguous to the

vowel, because these are considered contrastive, but does not mark allophonic nasality near nasal consonants. This means that it could be phonologically possible to have a minimal pair for a word with a nasalized vowel, as exemplified by the made-up minimal pair /di:bẽ/ and /di:be/.

2.3.4.2 Vowel allophonic variation

As was noted in the description of Ojibwe phonology, there is some variation on the pronunciation of vowels. For this thesis, the vowels were transcribed as they were pronounced and the variation is discussed further in the results section.

2.3.5 Glottal stops, glottalization and aspiration

Ojibwe has two glottal consonants /h/ and /ʔ/. In the initial look at the data sample, there were instances of both glottal stops and what will be referred to as aspiration, the glottal [h]. It is difficult to tell the phonetic difference between aspiration and glottal /h/, and for the purposes of this thesis, it has all been classified as aspiration and is represented with a superscript [h]. Aspiration was noted word finally on both consonants and vowels. As it did not seem to happen across the board, it was not included in the final broad transcription. A glottal stop was noted in two speaker's pronunciations of *waaye'aa* ('circle'). In another speaker's production of the same word, glottalization was noted to have spread to the vowels. To the best of our ability, glottal stops and glottalization were marked in the narrow transcription. They were not marked in the broad transcription because the pattern was not observed across all consultants. However, those words which contain glottal qualities will be marked

with an asterisk (*) next to the orthography in the narrow transcriptions, in the broad list (if included as a target), and in the Basic Word List and Extensions A and B. Examples (10) and (11) below show glottal stops and glottalization; examples (12) and (13) show word-final aspiration.

(10) *waaye'aa*
waaye'-aa
circular-VII
'wɔː.wi.e.jɑʔɑ
'circle' (3-32)

(11) *waaye'aa*
waaye'-aa
circular-VII
wɔː.jɛː.gːʰ
'circle' (1-31)

(12) *deh*
o-deh
3P-heart
oː.'deːʰ
'his/her heart' (1-25)

(13) *dinmanganak*
dinmangan-ak
shoulder-PL
'den.mɑːŋ.ʌ.nɔkːʰ
'shoulders' (1-52)

2.4 Final Word list Selection and Transcription

Final word list selection must take into account feedback from the consultants regarding the suitability of words and whether words or productions were actively used in teaching and everyday

conversation and the phonological content of the data that were collected (following the nonlinear tier system discussed briefly in the introduction). While selecting target words, the words were transcribed broadly for ease of use by SLPs. The complexities of speaker variability are addressed in the results section below.

Following Stoel-Gammon and Williams' (2013) format for word list creation, three lists were created for elicitation: a Basic word list (n = 45) with less complex words for all children; an Expanded list (n = 25), a list of more complex words and structures for older children or children with more advanced phonology; and a third list (n = 20) of simple words to use as a supplement if more data are needed about phonologic production in single words.

Chapter 3: Results

The following section discusses the findings from the data analysis of the narrow transcriptions, presenting the variability found across speakers in relation to all areas of phonology transcribed:

consonant and vowel production, word length and word shape (including morphology), and stress.

Consultant perspectives on the word choice for the list are also reported in the final section. (Appendix B presents the full list of the words with narrow transcriptions.)

3.1 Findings from the Data: Speaker Variability

The following section details the findings from the narrow transcriptions, showing some of the possible pronunciations for chosen words in this dialect of Ojibwe. It is very important to note that the sample size for this project was small ($n=5$) and limited by the age range of the speakers. This analysis is a sample of what speakers may produce in single-word elicitation tasks, and is by no means exhaustive of the possible productions for the language. Some words showed more variation than others. Where one is unsure of the production for a particular word, the reader is encouraged to consult the narrow transcriptions in Appendix B for each speaker's production. Results for consonants, vowels, stress, word shape and word length are presented in separate sections below.

3.1.1 Consonants

Based on the consonant chart from the introduction, Table 4 shows the variants for each of the consonants used for broad transcription.

Consonant Singletons	WI			WM			WF			
b	b	b̥	p	b	b̥	p				
d	d	d̥	t	d	d̥	t				
g	g	g̥	k	g	g̥	ɣ	n			
t	t ^h	t		t ^h	t		t ^h	t		
p	p ^h	p		p ^h	p	ϕ	p ^h	p ^ˀ		
k	k ^h	k		k ^h	k	k ^x	x	k ^h	k	n
ɕ	ɕ	ɕ̥	tʃ	ɕ	ɕ̥	ʒ				
tʃ				tʃ						
s	s			s			s			
z	z	z̥		z	z̥	s				
ʃ	*			ʃ	ʃ			ʃ		
ʒ	ʒ	ʒ̥		ʒ	ʒ̥					
m	m	p ^{**}		m			m			
n	n			n			n			
w	w			w	V ^w					
j				j						

Table 4: Consonant Variation Based on Data From Five Speakers

Length is marked in the narrow and final transcriptions where it occurs, but is not being considered as a variant of the phoneme itself in this analysis and is therefore not marked in this table. In addition, words that were suggested by consultants (thus not having more than one production) were not included in this analysis because there were only one or two productions of those words and they were not elicited in the same way as the word list. In the table there are a number of grey boxes, mostly in word-final position. These boxes indicate that there were no words in the elicitation list with these sounds in those positions. The current data reveal relevant variation patterns in phonological positioning

of consonants, consonant lenition and deletion, consonant voicing and devoicing, and aspiration of consonants, discussed in turn below.

While there appears to be a lenis/fortis contrast in other positions, the data support Valentine's (1994) statement that this dialect has only voiceless obstruents word finally. There is an asterisk in the WI box for /ʃ/ because, although our list contained no WI singletons for this phoneme, productions occurred in WI consonant clusters as discussed below. For example, one of the words suggested by one of the speakers, *nshaaswi* ('nine'), began with [ʃ] with the nasal deleted. However, this word was not included in the analysis or in the final word list partly because it did not occur multiple times, and furthermore, young children may not use all words for numbers, meaning this word would not be kept in the final word list in any case. The /j/ and /w/ had no productions word finally and /j/ was only found in WM position. It is possible that there are words with glides in these positions in Ojibwe, but they may not have fit the other criteria for word list creation.

The second area concerning variability is that of consonant lenition. Supporting the initial findings as discussed in the Methodology 2.3.3.1, there appears to be some cases of consonant lenition with several consonants, although not necessarily in a predictable pattern. One of the consultants, 5-14, did use this pattern more than the other consultants. The following examples (14) through (18) are examples of possible lenition for /g/, /dʒ/, /k/, /p/ and /b/:

- (14) *giigoonh*
 giigo-onh
 fish-DIM
 'ʎi:ɡõ:^h WI /g/ as [ʎ]
 'fish' (1-161)
- (15) *bdakjii'gan*
 bdakjii'-gan
 stick.something.in.things-NOM
 bə.'dΛ.kə.'ʒi.ɣΛn WM /dʒ/ as [ʒ]
 'fork' (5-241)
- (16) *waagoshinhs*
 waagosh-inhs
 fox-DIM
 'wax.ʃ:ẽ:s: WM /g/ as [x]
 'little fox' (5-113)
- (17) *doopwin*
 doop-win
 table-NOM
 'd̥o:ɸ:win: WM /p/ as [ɸ]
 'table' (3-272)
- (18) *waaboozonh*
 waab-ooz-onh
 rabbit-animal-DIM
 'wa:βo:zõ: WM /b/ as [β]
 'rabbit' (3-141)

Another interesting pattern was the voicing contrasts between a WF consonant and when that WF consonant becomes a WM consonant with the addition of morphological endings. The morphology is discussed in greater detail in section 3.2. However, for the purpose of this section it is important to

note that when vowel-initial morphology is added to a WF fortis consonant, either voicing occurs or the underlying voiced phoneme that is realized with the addition of morphology becomes devoiced as is demonstrated in examples (19) and (20) below for the words *wiibit* and *wiibdan*. Either way, there is a contrast in voicing.

(19) *wiibit*
wiibit
tooth
^hwi:bit:
'tooth' (3-65)

(20) *wiibdan*
wiibd-an
tooth-PL
wi:ba.'dan
'teeth' (3-64)

In addition to the voicing contrasts noted above, there were also two examples of consonant lenis/fortis changes. In examples (22) and (24) it is possible that the voicing feature assimilated to [-voice] of the neighboring consonant after the deletion of the weak vowel shown in the root word in examples (21) and (23).

(21) *waagosh*
waagosh
fox
wɔ:ˠ.ʎɔʃ:
'fox' (5-110)

(22) *waagoshinhs*
waagosh-inhs
fox-DIM
'wax.ʃ:ē:s:
'little fox' (5-113)

(23) *waagosh*
waagosh
fox
'wɔ:.ḡuʃ:
'fox' (3-115)

(24) *waagoshenh*
waagosh-enh
fox-DIM
wɔ:k.ʃɛ
'little fox' (3-116)

Valentine (1996) states that WF fortis consonants may also show aspiration. For the most part this was supported by the data but there were some instances where there was no aspiration. One of the consultants in particular, tended to be variable in the use of aspiration in WF position, while others used it more regularly. Examples (25) and (26) show tokens with and without aspiration in WF position for *bezhik*.

(25) *bezhik*
bezhik
one
'pɛ:.ʒik:^h
'one' (2-1)

(26) *bezhik*

bezhik

one

'be:ʒik

'one' (4-1)

3.1.1.1 Consonant clusters

Table 5 below shows the clusters that were produced in WI and WM positions. Note that there are no consonant clusters in WF position. There appear to be more clusters in these data than are suggested by the research discussed in the literature review of Nichols and Nyholm (1995), which discussed dialects of Ojibwe without vowel syncope.

Cluster	Word-Initial (WI)	Word-Medial (WM)	Word-Final		
m__	pk				
	mt				
	mskw	pskw			
	pʃ	mʃ			
	psk	mpsk		ksk	sk
Cw	sw	nsw	k:w		
	kw		pw	ɸw	
	gw		gw	go*	gɔ*
			sw		
			bw		
			sko:*		
ʃ__	ʃkw		ʃk		
	ʃt				
	ʃk				
Other	zg		kk	xk	
	bn		kʃ	xʃ	
	bɜ		ŋn	ŋg	
			bg		

Cluster	Word-Initial (WI)	Word-Medial (WM)	Word-Final
	nd	bk	
	nk	km	
	nd	bʃk	
	ps	ng	
	gz	zn	
		kn	
		mk	
		nm	
		gʒ	
		ʒg	
		zb	
		pt	

Table 5: Consonant Clusters Based on Data from Five Speakers

*Note: The CV and CCV sequences in the table are not clusters but are possible examples of coalescences of the glide /w/ and the vowel as shown in example (27) below.

- (27) *mskwaande*
msk-waande
red-VII
'mi.skɔ:n.de:^h
'red' (1-22)

The clusters in the table do not show as much variation as the lenis/fortis distinction in consonant singletons or in vowels and all but one case of variation can be explained by lenition or nasal assimilation. However, for CCs that begin with the nasal /m/, the [m] appears to be more stop-like than nasal and is often transcribed in these data as a [p]. Examples (30) and (31) illustrate the different pronunciations between two speakers for the [mskw] CC.

(28) *mskwaa*
 msk-waa
 red-VII
 'mskwa:
 'red' (3-22)

(29) *mskwaa*
 msk-waa
 red-VII
 'pskwa:
 'red' (5-20)

3.1.2 Vowels

As has been mentioned previously in the introduction and the methodology sections of this thesis, Ojibwe phonological productions seem to be quite variable, and vowel production is no different. Table 6 provides a list of the variation for the vowels. In the cases of vowel syncope, no vowel was produced and this information is not included in the table. Glide + vowel combinations are included as there was some variation with these productions. Vowels were transcribed in the broad word list using the most common vowel production across the participants.

		WI			WM					WF	
Short Vowels	i				i	ə		ɑ*		i	ɛ(:)
	o				o	ɔ		u			
	ɑ	ɑ			ɑ	ʌ	ə	ɑ:	u	ɔ	ɑ
Long Vowels	i:				i:			i:		i:	
	e	e(:)	ɛ(:)	o*	ɛ(:)		e:		ɛ(:)		
	o:				o(:)		ɔ:		o:		
	ɑ:	ɑ:	ɒ:		ɑ(:)		ɒ:		ɑ:		
Nasal Vowels	ĩ:										
	ĩ:				ĩ:					ĩ:	

		WI		WM			WF				
	ẽ:			ẽ:	ẽ:	e:	ẽ:	ẽ:	ε:		
	õ:						õ:	o:			
wV	we			we	o	ɔ					
	wI			wI							
	wa:	wa(:)	wɔ:	wɔ(:)	wɔ		ɔ	ɒ:	wa(:)	wɔ(:)	
Vw	a:w			au	a(:)						
Vowels Between CC				ɛ	ɪ	ɔ	ə	ʌ	e(:)		

Table 6: Vowel Variation Based on Data from Five Speakers

*Note: Those vowels with marked by an asterisk appeared in specific words and are not necessarily representative of the productions across speakers.

As an overview, there appears to be more variation in the productions of short vowels as opposed to long or nasal vowels, especially with the low back short vowel /a/. In addition, the row labeled “Vowels between CC” also had a considerable degree of variability. This row indicates vowels produced between consonants and which were not indicated in the orthography of the word. Most of these “epenthesized” vowels (i.e. vowels that are not reflected in the orthography) were short.

With respect to the types of vowels found in WI, WM, and WF positions, WI and WF places had limited number of vowels. It is possible that there are other words or pronunciations that would fit into the grey boxes, but the elicited words did not. There were a total of five vowel-initial words in the word list that began with either /a/ or /e/: *esban* ('raccoon'), *amik* ('beaver'), *aamoo* ('bee'), *ezaawmingaanh* ('orange', the fruit), *emkwan* ('spoon'). There were not many vowel-initial words in the word list (five only), and these words began with either /a/ or /e/. There were considerably more word-final vowel targets, although with a gap for /ã:/ and /o/.

An interesting variant in the data was the coalescence of /w/V to a single V. Valentine (1994) states that the Odawa dialect has “coalesced *wa* to *o* in all environments” (p. 142), although there does appear to be some variation amongst the consultants from this project. Some of the variations for /wa:/ were: [ɔ:], as shown in example (30); [wɔ:], as shown in example (31); [wɔ:], as shown in example (32); and [ɑ:], as shown in example (33).

(30) *mskwaande*
 msk-waande
 red-VII
 'mɪ.skɔ:n.de:^h /wa:/ becomes ɔ:
 'red' (1-22)

(31) *mkwa*
 mkwa
 bear
 mɬ.k:^hwɔ:^h /wa:/ becomes [ɔ:]
 'bear' (1-117)

(32) *ozhaawshkwaa*
 (o)zhaawshk-wa
 green-VII
 'ʒɑ:.ʃkwɔ:/wa:/ becomes [wɔ:]
 'green' (5-15)

(33) *baagwaakwenh*
 baagwaakw-enh
 chicken-DIM
 'bɑ:.k^hɑ:.k^hwɛ:^h /wa:/ becomes [ɑ:]
 'chicken' (1-140)

3.1.3 Stress and word shape

Stress patterns were very often difficult to discern. There were some words, however, that all consultants produced with the same stress, or all but one consultant. When these stress patterns were the same in at least 80% of the inter-speaker productions, stress was marked on the final word lists as exemplified in (34). Analysis was challenging due to vowel syncope and the fact that it was applied unpredictably by different consultants. In the cases where stress was not applied uniformly, it was left out of the transcription of the broad word list. Example (34) shows broad transcription and stress for the word *bezhik* (one). Examples (35) and (36) illustrate stress variation between two speakers for the production of *dinmangan* ‘shoulder’, and example (37) and (38) for *dinmanganan* ‘shoulders’.

(34) *bezhik*
bezhik
one
'be:ʒik Sw
'one' (Final1)

(35) *dinmangan*
dinmangan
shoulder
dn.'mã:ɡʌn wSw
'shoulder' (4-51)

(36) *dinmangan*
dinmangan
shoulder
'ten.'mã:ɣən SSw
'shoulder' (5-48)

(37) *dinmanganan*
 dinmangan-an
 shoulder-PL
 'dʌn.mɑ:ŋ.ˈnʌn SwS
 'shoulders' (2-64)

(38) *dinmanganan*
 dinmangan-an
 shoulder-PL
 'dɪn.mɑŋ.gən Sww
 'shoulders' (3-54)

Just as stress is affected directly by vowel syncope, so also is word shape. For the purposes of this section, word shape and syllable information will be drawn from the list of words that was created to be working basic phonemic targets and is a composite broad transcription from the five speakers. Due to the amount of variation between speakers, it is difficult to discuss word shape and number of syllables collectively without doing so. This composite list, from which evaluation words were selected, can be found in Appendix C, along with a table containing the words organized by syllable length and word shape. The words in the list range from one syllable up to six syllables in this list (although words in Ojibwe can become much larger with the addition of more morphology or with verb phrases), with a majority of the words being disyllabic or trisyllabic words.

For this analysis, consonants and vowels that presented in the data as long, C: or V:, were treated as CC and VV respectively. The smallest word shapes were three segments: CVC (*dip* and *pin*); and CVV (*deh*). The longest word shapes were 14 segments: CVV.CCVVCC.CV.CVC

(wiigwaasminan); CCV.CVV.CV.CVV.CVV (*ndamaakmeshiinh*); CVV.CV.CVV.CV.CVCC

(menwaagmig); and CVV.CVV.CV.CV.CCVV (*jejiibdakiinh*). Vowel syncope seems to be creating

clusters where historically there were no WI consonant clusters word (Valentine, 1996), increasing the challenges for acquisition. Adding to these complexities and the length of words is the rich morphology of Ojibwe, discussed in the following section.

3.2 Morphology

One of the key components of this study has been the interaction of morphology and phonology, touched on above in the consonants section. Morphology that was both elicited and volunteered by the consultants is presented here. A reflection on possible changes in target pictures to reduce morphological variability is presented in the Discussion. The morphological areas discussed below are the diminutive and the plural markers, and animate and inanimate endings for colors (which are discussed in section 3.3). For a more detailed look at noun inflection, consult Valentine (2001) where he discusses morphology of not only plural and diminutive, but also obviation, contemptive, pejorative, possessor, obviative possessor, locative, vocative, preterit, and preterit dubiative. This section highlights diminutives and plurals in some detail; see Appendix B for some additional information about other aspects of Ojibwe morphology.

In Ojibwe, “almost all nouns have DIMINUTIVE forms” which indicate their smallness or physical immaturity (Valentine, 2001, p. 172). There were a number of words that were produced with

the diminutive form in elicitation, for example: *zid-enhs* ('toes'), *pichi-inhs* ('robin'), *binooj-iihns* ('baby'), *kwe-zenhs* (girl), *gwi-zehns* ('boy'), *emkwan-enhs* ('teaspoon'), *tatagaan-enhs* ('bell'), *waagsh-ens* ('fox'), *bnesh-iihns* ('bird'), *gaazhag-enhs* ('cat'), and *daabaan-enhs* ('car'). Each of these forms has a root, for example, *kwe-zenhs* ('girl') comes from the root *kwe* ('woman') and would literally be translated into English as 'small woman'. In the language source books for creation of the original list, certain words were in the diminutive form and were chosen as the target elicitation forms. Consultants often produced both forms for the recordings and these data can be found in Appendix B Narrow Transcriptions. The Nishnaabemwin Reference Grammar (Valentine, 2001) lists the following as diminutive morphology: *-enhs*; *-ns*; *-V^(lengthed)ns*; *-oohns*; and *-iihns*; the different vowels of the diminutive were originally predictable from the phonological environment and correlate with vowel differences in plurals, but the phonological conditioning is not always readily apparent from the current phonology of Odawa. Valentine's grammar should be consulted for more detail on noun classes and use of the diminutive. An example of a diminutive and non-diminutive form for *sub* (net) is provided in examples (39) and (40) below.

- (39) *sab*
 sa-b
 net-bush like
 's:ʌḅ
 'net' (4-207)

- (40) *sabiins*
sa-b-iinhs
net-bush-like-DIM
'sA.ḥĩ:s:
'small net' (4-208)

Without the diminutive, *sa-b* is the large net that you stretch across the river to catch fish, while with the diminutive morphology *sa-b-iins* would be more like the small net one uses for catching butterflies. Consultants sometimes produced diminutives where we had not intended them, as with the picture of a cat (where some consultants used a diminutive, essentially 'kitty'). It is likely that children tested on any word list will occasionally (and unpredictably) do the same, with the consequence that some WF consonants become WM, and words will increase in length (which can also affect phonological matches in the speech of children).

The second aspect of morphology to present is the use of plural markers. In the creation of the original word list, careful consideration was made in the selection of pictures that may be interpreted as having plural items. For example, the word *pin* ('potato') was the target word in our word list (using a picture of one potato), whereas *piniik* ('potatoes') was not. However, consultants were often asked for the plural forms to provide data regarding plural markers, in the event that a child were to respond with a plural form and not the singular of a particular target. Consultants did occasionally spontaneously use plurals (such as 'shoulders') where we had intended a singular target, and we expect that children will

occasionally do the same, with the consequence that some WF consonants become WM, and that the word is longer (which can also affect phonological matches in the speech of children).

Ojibwe classifies nouns into animate and inanimate, and depending on the morphology applied, some nouns (like colours for example) can be labeled as either one (Valentine, 2001). In his reference grammar, Valentine (2001) lists the following possible plural endings: for animate nouns, the basic form is /-ag/ and its variants are /-ag, -g, -wag, oog, -og, iig, -ig/; and for inanimate nouns, the basic form is /an/ and its variants are /-an, -n, -wan, -oon, -iin, -in/. (The different vowels of the plural affixes were originally predictable from the phonological environment, but the phonological conditioning is not always readily apparent from the current phonology of Odawa.) All words which were collected in the singular and plural can be found in Appendix B. Below are examples (41) and (42) for the words *pin* and *pinik*.

(41) *pin*
pin
potato
p^hin
'potato' (2-249)

(42) *pinik*
pin-iik
potato-PL
p^hɪ.ni:k^h
'potatoes' (2-247)

While the initial word list was a very important part of this project, the most valuable information we received was from the consultants' views on the words selected and the cultural influences on language, discussed below.

3.3 Consultant Report and Word Elimination

Throughout the word elicitation, the consultants were encouraged to discuss their opinions on the words, to provide alternative pronunciations or words for the working word list, and to recommend the removal or addition of words. Discussed below are cultural teachings and their impact on the words used, and a list of the words that were unknown or not preferred by the consultants and were thus removed (as discussed further in Chapter 4). All of the information discussed below comes from the consultants' thoughts on the word choices.

Basing the word lists on the books purchased from the Wikwemikong Heritage Organization (2014), numbers, colours, shapes, body parts, animals, people, places, foods, and some house items were selected as possible word elicitation targets because these were both in the materials and also widely taught in the mainstream English and French school system. However, one of the consultants, a teacher, noted that children do not learn shapes and professions categories through direct teaching in her classroom. Numbers are touched on but are not a focus, unless someone asks for the date. Additionally, it was noted by another consultant that numbers are usually not used in isolation but are morphemes of a compound word. Body parts are often embedded in a verb. Shapes and professions are not taught

because, according to a consultant, they are not something that is talked about in daily life. This consultant also mentioned that while some teachers will teach numbers, colours, shapes, and body parts, she prefers to focus on commands, nouns found in the environment, and verbs as these are more applicable to daily life.

During the elicitation of colours, it was noticed that consultants were using different pronunciations. They explained that, depending on the type of noun the colour is describing, there will be either an animate or inanimate ending for the colour. For example, if one was looking at a white rabbit, one would use the animate word *waabshk-izi* to describe its colour, and if it were a white pail, one would use the inanimate word *waabshk-aa(nhde)*. The pictures used in the elicitation were not explicitly of an animate or an inanimate object and thus resulted in different productions from each of the consultants based on their interpretation of the picture. For more information regarding color morphology refer to Discussion section 4.3.

Some words on the list were not used or were unknown by the consultants. None of the consultants had a word for *oboodashkwaanishiinh* ('dragonfly'), and a few did not use a word for *signawish* ('worm'). It was explained that sometimes words are created for things in the environment but that they are not fully disseminated through out the population. The word for “peanut” that was collected from the resource materials did not match with the word in the lexicon of the speakers. It was reported by some of the consultants that the words for the colours yellow, brown, and orange are the

same word in their lexicon. Any words not used by the speakers or for which there were different words, were removed from the final list as discussed in Chapter 4.

Chapter 4: Discussion

In this section of the thesis, all information that has been gathered and analyzed are discussed and a working word list will be presented for use by the SLP. A discussion on the limitations of this research will follow. As the research team encourages future research with this language and other First Nations languages, the thesis will finish off with information on where to go from here in terms of research as well as the significance of using culturally and linguistically relevant tools like this one in SLP practice.

4.1 Word Selection Criteria

Final word selection was based on the cultural and age suitability of the words and the phonological requirements as discussed in section 2.1.

4.1.1 Cultural and linguistic suitability

As mentioned in section 3.3, one of the consultants does not teach certain categories that are taught in English-speaking classrooms, such as shapes and professions. This information is very important because it shows a difference between the language program books used for creation of the initial word list and the perspective of a First Nations educator speaking and teaching the Odawa dialect in the classroom. While the adults knew the words that were being elicited, if these words are not being taught to children at a young age, there could be a number of words in the word list that would not be applicable to children. For the purposes of the final working word list, the following were removed: the

category of shapes (*kakdeyaa* ‘square’ and *waaye’aa* ‘circle’); the word for *tkonwe nini* ‘policeman’ (removed for low frequency of use); the colors *zaawmingaa-* ‘orange’, *ozaaw-* ‘yellow’, and *kiiwaa-* brown (removed for being almost the same words); *oboodashkwaanishiinh* ‘dragonfly’ and *signaawish* ‘worm’ (removed for unfamiliarity); and *zhoomnensan* ‘peanut’ (not the word used in the dialect area).

All of the words that were added by the consultants were considered for use in the final word lists.

4.1.1.1 Age-related word familiarity

Knowledge on age-related word familiarity was based largely on English vocabulary learning from personal experiences in childcare settings and in consultation with language tools such as the MacArthur Bates CDI (Bates, Dale, Fenson, Marchman, & Thal, 2007). At this point in time, there is no research on typical lexical development of Ojibwe-speaking children from which to select words.

4.1.2 Phonological factors

Selection of words for the final word list required that they sampled the various levels of the phonological system. The basic word list required that one form be selected as the target production. As shown in the Results, speaker variability resulted in some of the words having similar, though not exact, pronunciations of each word. This included variation in the use of morphology. The morphologically complex forms that the consultants used for some of the words are similar to what a child might say during elicitation; it might be difficult to elicit certain forms without morphological endings. Based on what the most frequent sound production was, a broad transcription was created for all of the words in

the word list that were deemed culturally and linguistically suitable. All of the words that were broadly transcribed can be found in Appendix C. Not all of the words from Appendix C were used in the word lists but were included for possible modification of the word lists as needed.

It is crucially important to note that, while the broad transcription may represent a possible pronunciation of the Ojibwe words, it is not the *only* possible production. Due to the variation across speakers, it is encouraged and recommended that the narrow transcriptions be consulted when child productions differ from the broad transcriptions. For example, the lack of vowels word initially may be explained by vowel syncope, in that metrically weak (WI vowels) were deleted. However, one of the consultants who often produced the words with the WI vowels stated that the adult generation knows that the words have these sounds, but in conversational speech, fluent speakers do not use them aloud. When teaching, this consultant makes a conscious effort to say them because otherwise the children learning the language would not know that the sounds are optionally there/underlying. This only serves to demonstrate the importance of developing a better understanding of speaker variability and the cultural, linguistic, and historical connections between what is produced in speech and Ojibwe phonology in general.

4.2 Ojibwe Word Lists

This section presents the three word lists that were compiled from the broad transcription word list found in Appendix C. Each word has been carefully selected to contain a sample of each of the

phonemes and a variety of word shapes and word lengths. For limitations on this data set, the reader is directed to section 4.3.

4.2.1 Basic word list

Table 7 provides the words for the Basic Word List (45 words) in order of the recommended thematic groups for elicitation. Note that if these are transcribed in a spreadsheet, they can later be sorted by initial phoneme, word shape or word length for analysis. When creating this word list, every attempt was made to represent each sound in WI, WM, and WF positions. In some cases, this was not possible since this word list is only a section of the original word list used for elicitation and was focused on words with simpler syllable structure and word length. If there is concern about a speech sound that is not included in this section, and it is not possible to administer one of the extensions, the SLP could take a word with that sound from the remainder of the words for elicitation.

Final Record Number	Orthography	Adult pronunciation	English translation	Word Shape	Word Length
1	bezhik	'be:ʒɪk:	one	CVV.CVCC	2
2	niish	'ni:ʃ:	two	CVVCC	1
4	niiwin	'ni:win	four	CVV.CVC	2
14	deh	'dɛ:	heart	CVV	1
18	binoojiinhs	bɪ.no:.'dʒi:s:	baby	CV.CVV.CVVCC	3
25	dip	dɪp:	head	CVCC	1
26	miinjisan	mi:n.dʒɪ.sən	hair	CVVC.CV.CVC	3
29	zid	'zɪt:	foot	CVC	1
30	jansh	'dʒʌ:ʃ:	nose	CVVCC	1
33	kaat	'kɑ:t:	leg	CVVCC	1
34	pichi	'pɪ.tʃɪ	robin	CV.CCV	1

Final Record Number	Orthography	Adult pronunciation	English translation	Word Shape	Word Length
35	zhgaak	ʒə.ˈgɑ:k	skunk	CV.CVVCC	2
36	amik	ʔɑ.ˈmɪk	beaver	CV.CVCC	2
37	aamoo	ɑ:.mɔ:	bee	VV.CVV	2
38	gaak	ə.ˈgɑ:k	porcupine	V.CVVCC	2
39	jidmoonh	ʧɪ.də.mɔ̃:	squirrel	CV.CV.CVV	3
43	waagosh	ˈwɑ:.gɔʃ:	fox	CVV.CVCC	2
45	zgime	zə.ɡɪ.mɛ:	mosquito	CV.CV.CVV	3
47	zhiishiibenh	ʒi:.ʃi:.ˈbɛ:	duck	CVV.CVV.CVV	3
51	waabooz	wɑ:.bo:s:	rabbit	CVV.CVVCC	2
52	googkoosh	ˈgo:.ˈkoʃ:	pig	CVV.CVVCC	2
54	esban	ˈe:.zə.bɑn	raccoon	VV.CV.CVC	3
57	bneshiinh	bɪ.ne:.ʃi:	bird (small)	CV.CVV.CVV	3
59	gaazhag	ˈgɑ:.ʒʌk	cat	CVV.CVCC	2
60	jejiibdakiinh	ʧɛ:.ʧɪ:.bə.dɑ.kɪ:	elephant	CVV.CVV.CV.CV.CCVV	5
66	maang	ˈmɑ:ŋ	loon	CCVVCC	1
86	mshiikenh	ˈpʃi:.kɪɛ:	turtle	CCCVC.CCVV	2
89	mgizi	mɛ.ɡɪ.zɛ	eagle	CV.CV.CV	3
92	ziibe	ˈzi:.bɛ	river	CVV.CV	2
93	mtik	mɪ.ˈtɪk	tree	CV.CVCC	2
94	sin	ˈsɪn	rock/stone	CCVC	1
98	sabiins	sʌ.bɪ:s:	net (small)	CV.CVVCC	2
100	jiisenhs	ˈʧɪi:.sɛɪ:s:	carrot	CVV.CVVCC	2
76	nboop	nə.bo:p:	soup	CV.CVVCC	2
102	pin	ˈpɪn	potato	CVC	1
105	bagweyaan	bɑ.bə.go.jɑn	shirt	CV.CV.CV.CVC	4
106	mkizin	mɪ.kɪ.zɪn	shoe	CV.CV.CVC	3
108	miiknoot	mi:.kə.no:t:	pants	CVV.CV.CVVCC	3
112	kik	ˈkɪk	pail/pot	CVCC	1
126	taswin	ˈtɑ:.swɪn	cupboard	CVV.CCVC	2
114	pabwin	pʌ.bwɪn	chair	CV.CCVC	2
115	shkwandem	ˈʃkwɑn.dɛm	door	CCCVC.CVC	2
116	tataagan	tɑ.tɑ:.ɡʌn	bell	CV.CCVV.CVC	3

Final Record Number	Orthography	Adult pronunciation	English translation	Word Shape	Word Length
118	zhoonya	ʒoː.ni.jaː	money	CVV.CV.CVV	3
125	shkode	ʃkɔː.deː	fire	CCV.CVV	2

Table 7: Basic Word List

The following is a summary of the word count analyses for the Basic Word List from Appendix

D.1. There are 11 one-syllable words, 20 two-syllable words, 12 three-syllable words, and one of each for four- and five-syllable words. Most common word shapes are CVVCC, CV.CVVCC, and CVV.CVVCC; there are three of each of these word shapes. Word length ranges from 3 units (e.g. *-deh* ‘heart’, CVV) to 14 (e.g. *baagwaakwenh* ‘chicken’ CVV.CVV.CCVV). The most frequent word length is seven segments, followed by six. The most complex word has 14 segments, with three having over 10 segments each.

The following consonants have two or more examples in each word position: WI /m, p, b, w, n, t, d, s, z, ʒ, dʒ, k, g/; WM /m, b, n, t, d, s, z, ʃ, ʒ, dʒ, j, k, g/; WF /p, n, t, s, ʃ, k/. There are three consonants that have only one elicitation possibility: /tʃ/ in WM position, and /m/ and /ŋ/ in WF position. The following consonants are missing (which may be a gap in the data or not a phonologically possible position for the phoneme): WI /ʃ, tʃ, j, ŋ/; WM /p, w, ŋ/; WF /b, w, d, z, ʒ, tʃ, dʒ, j, g/. Based on the fact that the lenis consonants are not present word finally in these data, it is possible that there are no lenis consonants in WF position. There are three WI consonant clusters, /pʃ, ʃk, ʃkw/, and three word medially, /bw, nd, ndʒ/. Note that there are larger numbers of WM /b/ and /g/, and WF /n/ and /k/.

Despite an attempt to avoid having too many tokens of one phoneme, which could possibly influence the child's productions of other phonemes, this imbalance is likely an artifact of the phonological frequency of these sounds in this dialect.

Ideally, vowel distribution based on weak and strong positions would be presented here.

However, due to the difficulties in identifying the stress patterns in these data, they cannot be presented with full confidence. The literature states that long vowels have to be strong and that weak vowels are often deleted (Valentine, 2001). It was clear that both cases were not always true, with stress varying across speakers. As such, vowel distribution with respect to stressed or unstressed syllables is left for future research.

For vowels, two or more are targeted word medially /ɑ, ʌ, ɔ, ə, o, ε, ɪ, a:, o:, e:, i:, ɪ:/; and word finally /ε, ε:, ẽ:, ɪ:/. There are a few examples of only one vowel in the following positions: WI /ɑ, ə, a:, e:/; WM /ã:, õ:/; and WF /e, ɪ, o/. No nasal vowels are targeted in WI position, nor /ẽ/ or /ε:/ in WM position.

As can be seen, there was an intentional emphasis on simpler word structure while at the same time trying to preserve the phonological variety found in the world list as a whole. One four- and one five-syllable word are included to provide basic evidence concerning the child's ability to produce longer words. In addition, there were six relatively simple consonant clusters provided in this word list. If the child seems to be producing the three-, four-, and five-syllable words with few errors of length

and/or managing most of the clusters, then Extension A would be recommended if further information is required. However, if the child appears to be struggling with word length and/or simplifying the consonant clusters, Extension B would be recommended if more information is required.

4.2.2 Extension A word list

Table 8 contains the list of 25 words for Extension A. These words are more phonologically complex and are also organized by order of the recommended thematic groups for elicitation. This list is intended to be used with children with a more advanced phonology. Because it does not contain all the target phonemes, it is to be used as a supplement to the Basic Word List. It contains more words with consonant clusters, more complex clusters and more multisyllabic words. By adding this word list to the Basic Word List, the total list would have 70 words for elicitation, which might need to be split into two parts, with a break for younger children.

Final Record Number	Orthography	Adult pronunciation	English translation	Word Shape	Word Length
3	nswi	ns:wε	three	CCCCV	1
12	zhaangswi	'ʒa:ŋ.s:wε	nine	CVVC.CCCV	2
6	ozhaawshkwaa (nde)	ʒa:ʊ.ʃkwa:	green	CVVV.CCCVV	2
7	waabkshaa (nde)	wap.ʃka:	white	CVC.CCVV	2
8	mshkwaa (nde)	'mshkwa:	red	CCCCVV	1
19	gwiiwzenhs	gwi:.'zε:s:	boy	CCVV.CVVCC	2
20	kwezenhs	'kwe:zε:s:	girl	CCVV.CVVCC	2
22	eknoomaaget*	ʔε.k ^h ε.no:ma:ɡε:	teacher	CV.CV.CVV.CVV.CVV	5
23	dinmangan	dɪn.ma:ŋ.ɡʌn	shoulders	CVC.CVVC.CVC	3
31	tawak	t ^h ʌ.'wɔk:	ear	CV.CVCC	2
32	shkiizhik	ʃki:.'ʒik:	eye	CCVV.CVCC	2

Final Record Number	Orthography	Adult pronunciation	English translation	Word Shape	Word Length
42	(waa)waashkesh	wɑ:ʃkɛ:ʃ:	deer	CVV.CCVVCC	2
46	ma'iingan*	mɑ.i:ŋ:.gɑn	wolf	CV.VVCC.CVC	3
48	waabganoojiinh	'wɑ:.bə.gə.'no:ʒʒi:	mouse	CVV.CV.CV.CVV.CVV	5
50	bezhgoogzhii	be:ʒə.go:g.ʒi:	horse	CVV.CV.CVVC.CVV	4
55	zhashkohn	ʒɑ.ʃk:ð:	muskrat	CV.CCCVV	2
58	bzhiki	bʒi.k:ɛ	cow	CCV.CCV	2
85	ndamaakmeshiinh	ndə.mɑ:kə.me:ʃi:	monkey	CCV.CVV.CV.CVV.CVV	5
70	esbikenh*	'ʔɛ.zə.bi.'k:ɛ:	spider	CV.CV.CV.CCVV	4
80	waagweyaanh	'wɑ:.gwe.jā:	banana	CVV.CCV.CVV	3
84	mdaamin	m.'dɑ:.mɪn	corn	C.CVV.CVC	3
124	ziisbaakodans	zi:z.bɑ:gə.dõ:s:	candy	CVVC.CVV.CV.CVVCC	4
107	wiikwaan	wi:kwa:n	hat	CVV.CCVVC	2
111	bdakjii'gan	bə.dʌ.gə.ʒʒi:.gʌn	fork	CV.CV.CV.CVV.CVC	5
117	gziibiignigan	gzi:.'bi:.'gnɛ.gʌn	soap	CCVV.CVV.CCV.CVC	4

Table 8: Extension A Word List

The following is a summary of the word count analyses found in Appendix D.2 for the Extension A Word List. There were 2 one-syllable words, 11 two-syllable words, 3 three-syllable words, and 4 each of four- and five-syllable words. Every word had a unique word shape and therefore there are no common word shapes. However, there are more words with clusters, as noted. Word length ranged from 4 units (e.g. *kwe* ‘woman’, CCVV) to 10 units (e.g. *baagwaakwenh* ‘chicken’ CVV.CVV.CCVV). The most common length of word is 9 segments, followed by 8-segment words. The most complex word has 14 segments, seven words having over ten segments each. The following consonants are found in Extension A: in WI position, /m, b, w, t, z, ʒ/; in WM position, /m, b, w, n, t, d, z, ʃ, ʒ, dʒ, j, k, g/; and in WF position, /n, s, ʃ, k/. The following consonant clusters were found in the

data: /pʃk(:), bʒ. gn, gw, gz, gʒ, kw, mskw, nm, ŋ(:)g, nd, ns:w, ŋsw, zb, ʃk/. The following vowels are found in Extension A: in WI position, /ʔɛ*/; in WM position, / a, ʌ, ɔ, ə, o, e, ɛ, ɪ, ɑ:, ɒ:, ɔ:, e:, ɛ:, i:, ɛ̃:, ɔ̃:, ɛ̃:, ɪ̃:, ʌ̃:/, and in WF position, /ɛ, ɒ:, i:, ɛ̃:, ɔ̃:, ɛ̃:/ . For a complete list of numbers refer to Appendix D.2 Extension A Word List.

4.2.3 Extension B word list

Table 9 below contains a list of the 20 words assigned to the Extension B Word List. The aspects of phonology targeted are similar to the words in the basic list but this list is provided in case more information is needed about the child's productions of shorter words with simple phonology. Because it does not contain all the target phonemes, it is to be used as a supplement to the Basic Word List. It contains more words with simple word structure and shorter word length than the words found in Extension A. By adding the words from this list to the Basic Word List, the two lists combined give a total of 65 words for elicitation, which would likely need to be split with a break for younger children.

The following is a summary of the word count analyses found in Appendix D.3 for the Extension B Word List. There are 4 one-syllable words, 9 two-syllable words, and 3 three-syllable words. Every word has a unique word shape and therefore there are no common word shapes. Word length ranges from 4 units (e.g. *kwe* 'woman', CCVV) to 10 units (e.g. *baagwaakwenh* 'chicken' CVV.CVV.CCVV). The most common length of word is 8 segments, followed by 4- and 5-segment words. While Extension A has many long words, the maximum word in Extension B has 10 segments

(only one token). The following consonants are found in the Extension B word list: in WI position, /m, b, w, n, t, d, z, ʒ, dʒ, k, g/; in WM position, /m, b, w, n, d, s/; and in WF position, /n, s, ʃ, k/. The following consonant clusters are included: /kw, mskw, ng, k:k/. Vowels in Extension B are: in WI position, /ə, e, ε/; in WM position, /a, ʌ, ɔ, o, e, ε, ɑ:, ɔ:, ε:, i:, ɔ:, ẽ:/, and in WF position, /ε, i:, ẽ:/. For a complete list of the numbers of phonemes refer to Appendix D.3 Extension B Word List.

Final Record Number	Orthography	Adult pronunciation	English translation	Word Shape	Word Length
21	kwe	'kwɛ:	woman	CCVV	1
24	doon	'do:n	mouth	CVVC	1
27	wiibdan	wi:bi.dʌn	teeth	CVV.CV.CVC	3
28	zidenhsan	zi.dẽ:sʌn	toes	CV.CVV.CVC	3
31	tawak	tʰʌ.'wɔk:	ear	CV.CVCC	2
44	makki	mʌk:ki:	frog	CVCC.CCVV	2
49	baagwaakwenh	'bɑ:kɑ:kwɛ:	chicken	CVV.CVV.CCVV	3
53	nimosh	ne.moʃ:	dog	CV.CVCC	2
56	giigoonh	'gi:gõ:	fish	CVV.CVV	2
61	moos	'mu:s:	moose	CVVCC	1
71	engoonhs	'ʔɛ:n.gõ:s:	ants	CVVC.CVVCC	2
81	zhoomin	'ʒo:men:	grape	CVV.CVCC	2
83	miinan	'mi:na:n	blueberries	CVV.CVVVC	2
88	kak	'kʌk:	Canada goose	CVCC	1
95	goon	ə.'go:n	snow	V.CVVC	2
96	daabaan	da:bɑ:n	car	CVV.CVVC	2
97	jiimaan	dʒi:ma:n	boat/canoe	CCVV.CVVC	2
99	demin	'de:min	strawberry	CVV.CVC	2
110	emkwaan	'em.kwɑ:n	spoon	VC.CCCVVC	2
113	doopwin	'do:pwɪn:	table	CVV.CCVCC	2

Table 9: Extension B Word List

4.3 Limitations of the Study and Implications for Future Research

There were a number of limitations apparent in this study having to do with materials, procedures, and clinical usability. These limitations are discussed below, along with recommendations for future research.

4.3.1 Educational resources for word selection

As has been mentioned in the introduction, there is no research on language acquisition for Ojibwe-speaking children and access to materials containing information about word frequency and usage for Ojibwe-speakers is not available. There were a number of factors that persuaded the team to select language materials from academic/school-oriented materials: no research on typical vocabulary development; no access to Odawa-speaking children from whom to collect language data; and the fact that school-aged children may be familiar with words from these materials.

There were challenges with using these materials that became apparent during data collection and analysis. Firstly, some of the words were not the same as those spoken by the consultants, and in some cases were not in their lexicon. Secondly, the books do not provide any linguistic information regarding pronunciation (aside from a CD) or morphology. For example, while the colour words were labeled as “animate” and “inanimate” in one of the resources, there is no information regarding use, or the fact that these words are verbs. While this information is not necessarily essential for teaching the language, it is essential for SLPs to be able to fully understand the child’s difficulties. One needs to be

able to distinguish whether a child's difficulties are phonological, morphological, semantic, or syntactic. In addition, the materials were somewhat inconsistent in the presentation of body parts. In Ojibwe, body parts are considered dependent nouns, which means they must be possessed by someone (e.g. *ndip* 'my head'). In the materials, this was represented some times but not others, and information regarding the different possessors was also not listed. Again, for teaching purposes, the language instructor is able to draw on their own knowledge of the language, whereas an SLP may not be able to draw from that body of knowledge. Not having the depth of knowledge about Ojibwe morphological structure prior to creating the word list resulted in a phonology-morphology interaction that contributed to the variability seen in the data. Finally, these materials are somewhat anglo-centric in that they appear to follow the Standard English curriculum in terms of vocabulary selection. Some of the consultants commented that the words were not commonly used in everyday life. In addition, some words that are considered simple in English, like 'square' are complex morphologically in Ojibwe (e.g. *kakdeyaa* 'square' literally means box-shaped and is a verb) and may perhaps develop later than other Ojibwe words.

Based on these factors, it is recommended that where words are being chosen from be considered very carefully. Ideally, it would be excellent to have data on word use frequency and lexical development for each language from child populations, but this information is in the early stages in most languages, especially First Nations languages. It is recommended that future research use

“language materials” with caution. Strong advocacy is also recommended for further research into language development, in particular lexical development, for the purposes of projects such as this one.

4.3.2 Word list procedures

One major limitation in the creation of the word list was in the procedures used. The initial word list used for data elicitation was created to have, as much as possible, at least two representations of each phoneme in the Odawa phonology. With this, the project was able to provide data on the speech sounds of Odawa, though this procedure did not allow for sufficient numbers of phoneme to be targeted across the three word lists. For example, WI and WM /t/ is not a common phoneme in Ojibwe. In the initial word list, there were three WI /t/ productions. When it was time to divide these words into the three word lists, two WI /t/ words went into the Basic Word List and the other /t/ word went into the other two lists. For other sounds, such as WF /p:/, there were no exemplars in Extensions A and B. As a result, the Extensions, while they do have some repeated phonemes, have a number of gaps. Future research on other languages should take this into account to avoid these gaps. This would mean the need for far more phoneme representations of each phoneme in each position in the initial elicitation word list. For future research using the current word list data, it would be desirable to return to collect more data to fill in the current gaps in the extensions and to make them more representative. In the meantime, the SLP can administer both the Basic Word List and one of the Extensions to increase the number of targets.

4.3.3 Sample size, variation, and pilot testing

The goal of this research project was to create a list of words that would be culturally and linguistically suitable for working with children who speak the Odawa dialect of Ojibwe. However, this project has not tested this list on children, either typically developing or with PPD. This is a limitation because it would not be considered an evidence-based evaluation tool, which is the basis for clinical practice. It can still be a very useful tool for descriptive analysis of child phonology.

In addition, our restricted number of adult speakers is not sufficient to draw conclusions about the phonology of the Odawa dialect; thus, the results should be considered only as possible productions that might be elicited from a child. One of the other limitations of this study was that only one production from each consultant was transcribed. To have a better idea of how a person typically pronounces something, it is important to compare multiple productions, because each time someone says a word it can be slightly different. For further information on speaker variation and social influences, the reader is referred to *The Oxford Handbook of Sociolinguistics* (Bayley, Cameron, & Lucas, 2013).

There appeared to be notable variation among speakers. Vowel and consonant production varied slightly from word to word with both intra-speaker (across the word list) and inter-speaker (between speakers with each word) analysis. Without careful acoustic analysis and a trained ear, it can be very challenging to notice some of these differences, especially for a native English speaker. For example,

English does not have a fortis/lenis distinction, nasal vowels, the same distinction between long and short vowels, or all the same vowels as Ojibwe. It may be challenging for an SLP with a different language background to hear these differences without practice. The narrow transcriptions as listed in the appendices allow the listener to gauge a child's productions if they differ from the broad transcription in the word list.

The speakers' pronunciations also differed in comparison to what the literature reports on the Odawa dialect. This may be due in part to being a dialect of Ojibwe that is slightly different from that reported in the literature (Valentine, 1994; 2001), and also due to the process of vowel syncope where weak vowels are deleted, which did not seem to happen with all productions from our consultants. For example, the literature stated that Ojibwe stress is quantity sensitive, left-to-right iambic binary stress (Valentine, 1994). However, with the deletion of weak vowels, the stress patterns in this data sample did not seem to match the stress system. In some cases, stress seemed to appear on the first syllable, even when it was metrically weak.

In the Odawa dialect, the majority of unstressed syllables have been deleted, leaving behind only stressed syllables. However, the process of vowel syncope is not fully consistent across speakers. This can result in a string of strong stresses, which leaves one with the task of predicting which of those syllables will take the primary stress, and if all would remain stressed. Additionally, some of the vowel sounds that the consultants were saying were not those listed in the possible variants in the literature, for

example [ɔ] for /o/ and for /we/. This may be due to the single word transcription or general variability in pronunciation that occurs in every person's speech. Also, the orthography does not always match the spoken output. In some of the complex clusters caused by vowel syncope, there appears to be the insertion of short vowels of reduced quality and duration, which are not found in the orthography.

In order to better understand the range of inter-speaker variability and the cultural and linguistic relevance to the Odawa child population, it would be beneficial to pilot-test this evaluation tool on children from this dialect area and to collect further data from adult speakers, such as other elders in the community, and the (grand)parents of any children tested. Pilot-testing this tool would require a better understanding of cultural interactions between children and adults in the community, the schools, and the medical system. In addition, a technique for eliciting words would need to be created which would encourage SLP-child interaction. Careful attention would need to be paid to the selection of suitable pictures that will elicit the desired word form. As noted in 3.2, the morphology can alter the phonology of the words and so it is important to pay close attention to what the target word is and to choose a picture carefully.

The current project as it stands, provides a working word list for the Odawa dialect. More research needs to be conducted on word shapes, stress patterns and pitch in the Odawa dialect. It is important to understand how a process such as vowel syncope affects production and how this manifests in the phonology of the new generation of speakers. In addition, further research on the environments

for vowel and consonant variation would perhaps help explain why and when variation is occurring across the word list. This project is limited in scope in that it only focuses on the Odawa dialect and only on the small word list collected. Each dialect of Ojibwe presents with a phonology that is similar in some ways but different in others. In order to use this tool with other dialects, it is important to understand the phonological patterns that exist for those particular dialects. Valentine (1994, 1996) provides brief accounts of the phonology for the dialects of Ojibwe, but how this would be applied in a clinical speech therapy setting has not been studied.

Finally, because this research is based only on single-word elicitation, how phonology interacts with morphology, syntax and pragmatics is not touched upon. Research related to the interaction of phonology with these other levels of language are important for a better understanding of the Ojibwe language and culture as a whole. Speech therapy practice does not focus only on phonemes in single-words but rather builds upon that foundation for use within natural conversation contexts. More data in this area would greatly improve the generalizability of treatment.

4.4 Clinical Use of this Tool

This thesis provides the SLP with a basic understanding of the phonology of the Odawa dialect, plus a working list of words that can be used to examine a child's speech development in a single-word elicitation task. However, to ensure this tool is applicable to the children from the Odawa-Ojibwe speaking communities, the tool needs to be pilot-tested, which will require the development of

community research partnerships with communities in the area and SLPs. Caution is noted; because this tool has not been tested with children from this community, it is not evidenced-based and should be used with that in mind. At this point in time, the tool is only a list of words. However, a scan analysis form will be later made available for use with the word lists to better assist the SLP in accurately identifying children with PPD and determining their speech patterns. The information presented in this thesis is a new source of information for SLPs and educators that can help in examination of a child's Odawa-Ojibwe speech development from this community. In addition, it may be helpful for evaluation of children's English speech development as potentially influenced by the Odawa dialect.

4.4.1 Applicability to 'English as a Second Dialect' learners

There are a number of children who may speak Ojibwe and/or speak a dialect of English that has been influenced by the Ojibwe speech, language and culture. Many of these children may speak a dialect of English that is different from the Standard English taught in the school system. Speech and language skills are pivotal for literacy and educational achievement (Ball, 2007); thus, children's performance in the academic setting may be negatively impacted by mismatches between their dialect and the dialect being used in the classroom (Ball et al., 2007). Ojibwe consonant and vowel repertoire is different from Standard English and may result in an English pronunciation that is different from the Standard English being taught in the school system (Peltier, 2011). If a child's dialect group pronounces

words differently from the Standard English used in schools, it is possible that dialectal spellings may also emerge, resulting in the child being considered to have spelling difficulties.

A better understanding of the phonological system of Ojibwe will help guide further study in the area of FNED for this population and may help inform SLPs of the differences between the languages that may result in noticeable differences in school. Children should be shown to negotiate between the two dialects for greater success in areas where Standard English are required and be able to use this bi-dialectal system (Peltier, 2011). With the ability to negotiate two different languages/dialects and cultures, it could result in higher retention rates in high school, instead of the lower graduation rates for First Nations people compared with the rest of the population (Mendelson, 2006).

Ball et al. (2007) have reported that children may be mis-diagnosed as having speech and language disorders as a result of a systemic lack of knowledge of the child's dialect and also because of the fact that culturally relevant norms have not been established to accurately assess children with nonstandard dialects of English. In British Columbia, The BC Ministry of Education supports English as a Second Dialect educational programs for children (both First Nations and immigrant) who speak nonstandard English (Education, 2009). However, due to the lack of consensus on what constitutes a dialect, and a lack of culturally suitable materials, there is little consistency in the application of the program (Campbell, 2011).

With greater understanding of the language or the dialect of English a child speaks, erroneous beliefs about the child's speech and language abilities will diminish and a culturally tuned educational path, with awareness of dialect differences, could emerge. A basic understanding of Ojibwe could also contribute to the development of programs to assist children in successfully negotiating between their FNED and Standard English, which would support future success in school.

4.5 Conclusion

There is some research in field of linguistics on the phonology of Ojibwe and of the Odawa dialect in particular, though most research is comparative. Research in the area of Ojibwe phonology as it applies to Speech and Language services is virtually non-existent and there are currently no culturally and linguistically suitable evaluation tools for speech or language to assist with assessment and treatment of Ojibwe speakers. This thesis has begun to bridge the gap between linguistic knowledge regarding the phonology of the Odawa dialect of Ojibwe and the application of this within a clinical setting. The creation of a word list, with the use of data collected with Odawa-Ojibwe speakers, is only the first phase in the creation of a culturally and linguistically suitable tool for speech assessment with this community. Further research is going to require the development of relationships within the First Nations community, further data collection from other adult speakers, the creation of culturally suitable elicitation methods, and the piloting of this tool with children who speak Odawa-Ojibwe. This current project would not have happened without the valuable contributions of the Odawa-Ojibwe speakers:

Gertie Manitowabii, Leland Bell, Margaret Young, Mary Ann Corbiere, and Stanley Peltier, and the assistance and coordinative efforts of Sharla Peltier. Thanks goes out to these people for their hard work and dedication in making this project a success.

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Appendices

Appendix A Initial Working Word List

The following table includes the initial word list that was elicited from the consultants following the word list creation methodology listed in the body of the thesis.

Orthography	IPA	English
Deh	'de:h	heart
Doon	'do:n	mouth
Dip	'dɪp	head
Jansh	'dʒã:ʃ	nose
Goon	'gõ:n ^h	snow
kaat	'k ^h a:t ^h	leg
kik	'k ^h ɪk ^h	pot
ka	k ^h a ^h	goose (wild)
niish	'ni:ʃ	two
pin	'p ^h ɪn:	potatoe(s)
sin	'sɪn:	stone
zid(an)	'zit ^h	foot/feet
zhashk	ʒaʃk ^h	muskrat
bezhik	'be:ʒɪk ^h	one

doopwin	'dop ^h .wɪn:	table
demin	'de:ɪ.mɪn	strawberry
daabaan	'd̥a:ba:n	car
jiimaan	'dʒi:.ma:n	canoe (boat)
jiisenhs	'dʒi:.sê:s	carrot
giigoonh	'gi:kõ: ^h	fish
gaazhag	'k ^h a:ʃak ^h	cat
googkoosh	'k ^h o:.'k ^h o:ʃ	pig
kwe	k ^h ʌ.'wɛ:	woman
kwezenhs	k ^h wɛ:.'zî:s	girl
mškwa	m.'skwa: ^h	red
mtik	m.'t ^h ɪk ^h	tree
makki	mak ^h .k ^h i:	frog
miiknoot	mik ^h .not ^h	pants
naanan	'na:n.ɪn	five

niiwin	'ni:.ʔwin	four
nimosh	'ne:.moʃ	dog
pabwin	pʰʌb.wɪn	chair
pichi	pʰɪʃ:ɪh	robin
sabiins	'sʌ.bɪ:s	net
shkiizhik(goon)	ʃʃki:.ʔɪk/ʃʃki.ʒi.go'n	eye
shkwandem	'ʃkwʌn.dɛm	door
tawag	tʰʊ.'wɔk:h	ear
waabkshaa	wʌp.ʃkʰa:h	white
waabooz	'wʌ:.bʊ:s	rabbit
waagosh	'wʌ:.gʊʃ:	fox
wiibdan	wi:b.'dʌn	teeth
wiikwaan	'wikwʌn	hat
ziibe	'zi:.be:	river
zidenhs	zi.dɛ:s	toes
zhoonya	'ʒon.ja:	money
zhgaak	ʒə.'gʌ:kʰ	skunk
amik	ʔa.'mɪk:h	beaver
aamoo	ʔa:.mɔ:	bee
emkwaan	'ʔem ^p .kʰwʌn	spoon
gaak	ʔə'k ^x a:kʰ	porcupine
esban	'ʔe:s ^ʔ .bʌn	raccoon
bagweyaan	'bʌ.gwej:ʌn	shirt
bzhiki	bɪ.ʒɛ:.kʰɛh	cow
binoojiinhs	bɪ.nɔ:.dʒi:s	baby
baagwaakwenh	'bʊa:kʰa:kʰwɛ:h	chicken
bneshiinh	bɪ.'nɛ:.'ʃi:	bird

dinmangan	'dɛn.ma:ŋ.gʌn	shoulders
gnebig	gɪ.'ne:.bɪkʰ	snake
gwiiwzenhs	'gwiuʔ.w ^ʊ .'sɛ:'s:	boy
gookookoo	'kʰo:.'kʰo:.'kʰo:	owl
kakdeyaa	'kʰak ^ʔ .de:.ja:ʊ	square
kiiwaande	kʰi:.wa:n.de:	brown
mkizin	m. 'kʰɪ.zɪn'	shoe
ma'iingan	'ma:.'ʔi:ŋ.gʌn	wolf
miinjisan	mi:n.dʒi.sʌn	hair
mgizi	mɪ.'gɪ.zɪ	eagle
mskomnag	m. 'skom.nakʰ	raspberries
mshiiimin	m. 'ʃi:.mɪn	apple
mshiiikenh	m. 'ʃi:.kʰɛ:	turtle
nswi	n.s:ɔ.'wɛʰ	three
tataagan	tʰatʰa:.'gʌn	bell
taaswin	tʰa:.'sə.wɪn	cupboard
waa(w)aashkesh	'wʌ:.wʌ:ʃi:.kɛ:ʃ:	deer
waaye'aa	'wʌ:.je:.ja:	circle
zgime	zə.'gi.me:	mosquito
zhoomnensan	ʒo:.'m ^ʔ ne:s:ʌn	peanuts
zhiishiibenh	ʒi:ʃi:.bɛ:	duck
ozaawaa	o. 'ʒa:.'ʔɔ:.'wʌʰ	yellow
signaawish	'sɪ.gɪ.'na:.'wɪʃ:	worm
eknoomaaget	'ʔɛkʰ.no.ma:.'get ^ʔ	teacher
ozhaawshkwaa	ʔʊ.'ʒa:ʊ.ʔʊ.'ʃkwa:h	green
jidmoonh	ʔʌ.'dʒɪ.də.mɔ:	squirrel
bezhgoogzhii	'bɛ:.'ʒə.'gʊ:.'gʊ:.'ʒi:	horse

bdakjii'gan	bə.'dʌ.kə.'tʃi.gʌn	fork
jejiibdakiinh	'tʃe:.'tʃi:.pə.'ta'kɪ:	elephant
tkonwe nini	tʰə.'kʰɔn.'we:.'ni.'ne:h	police officer
waabganoojiinh	'wa:.bə.kʌ.'nɔ:.'tʃi:h	mouse
ezaawmingaanh	ʔe:.'zɑ:u.mi.nə.kã:h	orange (fruit)
gziibiignigan	gi.'zi:.'bi:.'kʰne.gʌn	soap
ndamaakmeshiinh	n̩.da.'ma:kə.'me:.'ʃi:h	monkey
ozaawmingande	ʔou.'zɑ:u.me.nə.'ka:n.'dʒe:h	orange (colour)
ooodashkwaanishiinh	ʔʌ.'bo:.'dʌʃ.'kwa:.'ni'ʃi:is:	dragonfly

Table 10: Initial Working Word List

Appendix B Narrow Transcription of Speaker Productions

Appendix B provides a list of words that were elicited from the language consultants and were considered for use in the final word list. The words are presented in order of elicitation except for the words that were volunteered by consultants, which are located at the end of the table and can be spotted because there are only one or two productions for each word. Words that were removed from the initial word list were not included here. New words that were suggested by the consultants have been transcribed and included in this table following the elicited words. These words were initially gathered from language materials put out by the Wikwemikong Heritage Organization (2014) and may contain words that are not culturally relevant or in frequent use in the home or in the educational environments of all Odawa-speaking children. For a discussion on the limitations with regards to gathering materials from these sources refer to section 4.3 in the Discussion.

Many of the words that were selected appeared to have internal morphological structure, which may not be as apparent as the morphology for the diminutive or plural which were discussed in section 3.2 on morphology. The words in this list have been segmented morphologically under the “Orthography” column using the morphological segmentation knowledge compiled from Valentine’s grammar (2001), and Nichols and Nyholm’s Ojibwe dictionary (1995), as well as previous knowledge gained through study of another Algonquian language (Cree). When morpheme breaks could not be determined confidently, this was indicated in the table. There were a number of morphological forms

worth pointing out, in addition to the diminutive and plural morphology discussed in section 3.2. These categories are taken from Valentine (2001):

1) Noun Finals

/-by/ (bush; tree)

/-min/ (berry, berry-like)

/-oozw/ (animal)

/(e)nhs/, */-jiinh/*, */shiinh(s)/* (diminutive); */-enh/* (contemptive)

/-n/, */-gan/*, or */-aagan/* (nominalizer- changes verb to noun), */-win/* (nominalizer to create inanimate nouns)

/-ag/ (animate plural); */-an/* (inanimate plural)

2) Reduplication

Some of the nouns present with reduplication, which is not consistently applied across speakers.

Morphological segmentation at the beginning of the word is marked to indicate suspected reduplication.

3) Obligatory possession

In Ojibwe, along with other Algonquian languages, body parts are obligatorily possessed nouns, or in linguistic terms, dependent nouns (Valentine, 2001; 2002). This means that morphology is necessary to indicate to whom a body part belongs (e.g. *n-dip* would be ‘my head’, *o-dip* would be ‘his/her head’). In a dialect with vowel syncope, the initial morphology may be absent in some productions, as is

demonstrated in the table below. Some of the speakers used possessive morphology though not consistently. The body parts are indicated by a hyphen at the beginning of the orthographic representation of the word (e.g. *-dip*). While not demonstrated in this list, body parts are often embedded in verbs and have verbal morphology (Valentine, 2002). This is important to note as children may produce the body parts in forms other than the intended target. For information on verb formation and body-part nouns in Ojibwe refer to Valentine (2001; 2002).

4) Verbs

In the list below, and in Ojibwe, colors and shapes are verbs. Those words that are verbs have been indicated with a “V” next to the English word. The inanimate verb stem for colours are: /-(w)aa/ and /-(w)aande/. The verb ending for animate inflection in this word list is: /-zi/. The verb stem for the shapes is /-aa/

English Translation	Ojibwe Orthography	1-14	2-14	3-14	4-14	5-14
one	bezhik	'be:ʒɪk: ^h	'pe:ʒɪk: ^h	'b̥e:ʒɪk: ^h	'be:ʒɪk	'b̥e:ʒɪk: ^h
two	niish	'ni:ʃ:	'ni:ʃ:	'ni:ʃ:	'ni:ʃ:	'ni:ʃ:
three	nswi	ni.'s:wɛ ^h	's:wɛ ^h	'ns:wɛ ^h	'ns:wɛ	's:wɛ
four	niiwin	'ni:.wɪn	'ni:.wɪn	'ni:.wɪn	'ni:.wɪn	'ni:.wɪn
five	naanan	'nɔ:.nʌn	'nɑ:.nʌn	'nɑ:.nʌn	'nɑ:.nʌn	'nɑ:.nʌn
be green (V)	ozhaawshk-waande	'ʒɑ:ʊ.ʃkwa:n.dɛɛ̃ ^h	ʒɑ:ʊ.ʃkwa:n.'dɛ: ^h	ɪ.'ʒɑʊ.ʃkwa:		'ʒɑ:.ʃkwɑ:
be white (V)	waabshk-aande	'wɔb.ʃka:n.dɛ: ^h	'wɔb̥.ʃk ^h ɑ:n.'dɛɛ̃ ^h	wɔp.'ʃka:	'wɔb̥.ʃka:n.'dɛ	wɔb̥.'ʃka:
be red (V)	msk-waande	'mɪ.skɔ:n.dɛ: ^h	'pskwa:n.dɛ: ^h	'mskwa:	'pskwa:n.dɛ	'pskwa:
	msk-waa				'pskwa:	
	msk-ozɪ			sko.zɛʔɛ		
				m̥.'sko.zɛ		
heart	-deh	o:.'dɛ: ^h	ŋ.'dɛɬ ^h	ɪ.'dɛ: ^h	'dɛ:	ɑ.'d̥ɛ:
			u:.'dɛ: ^h			
square V- literally 'be square'/box shaped	kak-dey-aa* (uncertain morpheme breaks)	k ^h ʊkə.'d̥ɛ:.'jɑ: ^h	'k ^h ɑ.kə.d̥ɛ:.'jɑ: ^h	'k ^h ʌ.k ^h ʌ.d̥ɛ: ^j ɑ:	'k ^h ɑ.kə.d̥ɛ: ^j ɑ:	'k ^h ak ^ʷ .d̥ɛ:.'jɑ:ɹy
box	mkak			pk ^h ʌ.k ^h		
small box	mkak-onhs					p ^h .'k ^h ʌ.k ^h ɔ:s:
circle V literally: 'be circular'	waaye'-aa*	wɔ:.'jɛ:.'g: ^h	'wɔ:.'wi.e.jɑ? ^h	'wɔ:.'wi.e.jɑ? ^h	wau.i.'jɑ:	'wɔ:.'wi:.'jɑ:

English Translation	Ojibwe Orthography	1-14	2-14	3-14	4-14	5-14
					wa: wi: 'ja:u	
baby	binoo-jiinhs	bɪ.no:.'ʤi:s:	bɪ.'no:.'ʤi:s:	bɪ.no:.'ʤi:s:	bɪ.no:.'ʤi:s:	pɪ.no:.'ʤi:s:
boy	gwiiw-zenhs	ə.gwi:.'zē:s:	gwi:.'zē:s:	gwi:.'zēs:	gwi:.'zē:s:	'gwi:.'zēs:
girl	kwez-enhs	ə.k ^h we:.'zēs:	'k ^h we:.'zē:s:	'k ^h we:.'zēs:	'k ^h we:.'zē:s:	'kwe:.'zēs:
		ə.'k ^h we:.'zē:s:				
woman	kwe	e.'k ^h we: ^h	'k ^h we: ^h	'k ^h we:	'k ^h we:	'k ^h we:
woman teacher	e-knoomaage-t-kwe	'k ^h ɪ.no:.'ma:.'ge:.'k ^h we: ^h	k ^h ɪ.no:.'ma:.'ge:.'k ^h we: ^h			
teacher	e-knoomaage-t*	'ε.k ^h ɪ.no:.'ma:.'get	'ʔε.k ^h ε.no:.'ma:.'ge: ^h	ʔε.k ^h ε.'no:.'ma:.'gē:	ʔɪ.k ² no:.'ma:.'ge:t	'ʔε.k ^h ə.nɔ:.'ma:.'gē:
	eknoomaage-t-nini-kwe					'k ^h .nə.'ma:.'ge:.'ni:.'ni.k ^h we:
Police Officer	tkonwe-nini	t.'k ² ɔn ² .'we:.'ni:.'ne: ^h	'k ^h wə.'ne:.'ni:.'ne: ^h	t ^h k ^h ɔ.nɔ ^w .'eo:.'ne:.'ne	tkɔ.nε:.'mi:.'nɔ	t ^h .'k ^h ɔn.'we:.'ni:.'ne:
Shoulder(s)	-dinmangan	'dɪn.mɑ:ŋ.gɔn		'dɪn.mɑŋ.gɔn	dɪn.'mā:.'gɔn	'ten.'mā:.'γɔn
	-dinmangan-ak	'dɛn.mɑ:ŋ.ɔ.nɔk: ^h	'dɔn.mɑ:ŋ.'nɔn		dɪn.'ma:ŋ.nɔn	
mouth	-doon	ε.'do:n	'do:n	ε.'do:n	'do:n	ɔ.'to:n
head	-shtigwaan	'ʃti.gwɔ:n				
head	-dip		ndɪp: ^h	'dɪp: ^h	'dɪp ^ʔ	ʔa.'dɪp: ^h
	-dip-enh				dɪ.'bē:	
hair	-miinjis-an	'mi:n.ʤɪ.sɔn	mi:n.ʤɪ.'s:ɔn:	'mi:n.ʤɪ.s:ɔn	mi:n.ʤɪ.'sɔn	'mi:n.ʤɪ.sɔn
teeth	w-iibd-an	wi:.'bɪ'dan	'wi:.'bɪ.dɔn	wi:.'ba:.'dan	'wi:b.dɔn	'wi:.'bɪ.dɔn
tooth	w-iibit			'wi:.'bit: ^h	'wi:.'bit: ^h	

English Translation	Ojibwe Orthography	1-14	2-14	3-14	4-14	5-14
toe(s)	-zid-enhs			'zɪ.ḍɛ̃:s:	zɪ.ḍɛ̃:s:	zɪ.ḍɛ̃:s:
	-zid-enhs-an		zɪ.ḍɛ̃:.'sɔn		zɪ.ḍɛ̃:.'sɔn	'zɪ.ḍɛ̃:.'sɔn
foot	-zid	ʌ.'zɪt: ^h	'zɪt: ^h	'zɪʔ	'zɪt: ^h	ə.'zɪt: ^h
feet	-zid-an				'zɪ.dɔn	
nose	-jansh	'ḍʒã:ʃ:	'ḍʒã:ʃ:	'ḍʒã:ʃ:	'ḍʒã:ʃ:	'ḍʒã:ʃ:
ear(s)	-tawag	ʌ.t ^h ʌ.'wɔk: ^h		t ^h ʊ ^w .'ɔk: ^h	t ^h ʊʌk: ^h	tɔ.'wɔk: ^h
	-tawag-anan	t ^h ʊ:.'gɔ.nɔn	t ^h ʊ: ^w .'gɔn		t ^h ʊ:.'gɔ.nɔ:n	tɔ:.'gɔ.nɔn:
eye(s)	-shkii-zhik	'ʃki:.'zɪk: ^h	ʃ:k ^h i:.'zɪk: ^h	ʃkɪ:.'zɪk: ^h	'ʃki:.'zɪk: ^h	ʃk ^h i:.'zɪk: ^h
	-shkii-zhig-oon	ʃki:.'zɪ.go:n	'ʃ:k ^h i:.'zɪ.go:n		'ʃki:.'zɪ.go:n	
leg	-kaat	'k ^h ɑ:t: ^h	'k ^h ɑ:t: ^h	'k ^h ɑ:t: ^h	'k ^h ɑ:t: ^h	'kɑ:t: ^h
worm	signaawish (not in dictionary)			sɪ.gɪ.'nɑ: ^w .ɪʃ:		'sɪ.gə.'nã:ʃ:
literally: 'small snake'	gnebik-onhs				næ.bi ^g .'õ:s	
robin	pichi	'p ^h ɪ.ʃɪ: ^h	'p ^h ɪ.ʃɪ: ^h	'pɪ.ʃɪ:	'p ^h ɪ.ʃɪ:	p ^h ɪ.ʃɪ: ^h
	pichi-inhs				p ^h ɪ.ʃɪ: ^h s	p ^h ɪʃɪ: ^h s:
skunk	zhgaak	ʒɪ.'gɑ:k: ^h	ʒə.'gɑ:k: ^h	ʒə.'gɑ:k: ^h	ʒɪ.'gɑ:k: ^h	ə.'ɣ ^g ɑ:k: ^h
beaver	amik*	ʔɑ.'mɪk: ^h	ʔɑ.'m:ɪk: ^h	'mɪk: ^h	ʔɑ.'mɪk: ^h	ʔɑ.'mɪk: ^h
bee	aamoo*	ɑ:.'mo:	ʔɑ:.'mo:	'ɑ:.mo:	'ʔɑ:.mo:	'ɒ:.'mo:
bees	aamoo-ik*				'ʔɑ:.mo:.'ɪk: ^h	

English Translation	Ojibwe Orthography	1-14	2-14	3-14	4-14	5-14
porcupine	gaak	ə.'gɑ:k ^h	'gɑ:k ^h	ʌ.'gɑ:k ^h	'gɑ:k ^h	ə.'gɑ:k ^h
squirrel	jidm-oonh	ʔe.'ʤɪ.də.mo:	'ʧɪ.də.mō:	ʌ.'ʤɪ.də.mō:	'ʤɪd.mō:	ʧɪɖ ^ə .'mō:
owl	goo-kookoo	'o:.'k ^h o:k.ʔo:	'k ^h o:.'k ^h o:.'k ^h o: ^h	go:.'k ^h o:.'k ^h o:	'ko:.'ko:.'ko:	'k ^h o:.'k ^h o:.'k ^h o:
bear	mkwa*	mʌ.'k ^h wɖ. ^h	'mʌ.k ^h wɖ: ^h	'k ^h ɖ: ^h	p ^h .'k ^h wɑ: ^h	mʌ.'k ^h wɑ
				mə.'k ^h ɔ ^h		
deer	waa-waashkeshi	'wɑ ^w ɑ.'ʃkɛ:ʃ: ^h	'wɑ:.wɑ:ʃkɛ:ʃ: ^h			
			'wɑ:.wɑ:ʃkɛ:ʃ:	'wɖ ^w ɖ.ʃ:k ^h ɛ:ʃ:	wɑ:.'ʃ:kɛ:ʃ:	'wɑ:ʃkɛ:ʃ:
fox	waagosh	wɑ:.'gʊʃ:	'wɖ:.'gɔʃ:	'wɖ:.'gʊʃ:	'wɑ:.'gʊʃ:	wɖ: ^w .'ɣɔʃ:
	waagosh-inhs					'wɑx.ʃ: ^h ɛ:s:
	waagosh-ihn			wɖ:k.ʃɛ		
frog	makki	mɑx.k ^h i:	mɑk ^x .k ^h i:	'mɑk ^h .k ^h i:	mɑk ^x .k ^h i:	mɑx:.'k ^h i:
mosquito	zgime	zɪ.gɪ.'mɛ: ^h	zə.'gɪ.mɛ:	ə.zə.gɪ.'mɛ:	zɣɪ.'mɛ:	zɛ.gɪ.'mɛ:
wolf	ma'iingan*	mɑ.'i:ŋ:.gɑn	'mɑ:.'i:ŋ:.gɑn	'mɑ.'i:ŋ:.gɑn	mɑiŋ.'gʌn	mɑ:.'i:ŋ:.'gʌn
duck	zhiishiib		'ʒi:.'ʃi:ɪp: ^h			
	zhiishiib-enh	ʒi:.'ʃi:.'bɛ: ^h	ʒi:.'ʃi:.'bɛ: ^h	ʒi:.'ʃi:.'bɛ:	ʒi:.'ʃi:.'bɛ:	ʒi:.'ʃi:.'bɛ:
mouse	waa-waabganoo-jiinh	'wɑ.wɑ.bə.ɣə.'no:.'ʤi: ^h	'wɖ:.'wɖ:b ^ə .kə.'no:.'ʤi: ^h	wɖ:.'bə.gʌ.'no:.'ʤi:	'wɑ:b.kɪ.no:.'ʤi:	wɖ:.'bə.gə.'no:.'ʤi:
	-waabganoo-jiinhs			'wɖ:.'bə.gʌ.'no:.'ʤi:s:	'wɑ:b.gɪ.no:.'ʤi:s:	
mice	waa-waabganoo-jiinh-ak		wɖ:.'wɑb.kʌ.'nō:.'ʤi:.'ɑ:k ^h			

English Translation	Ojibwe Orthography	1-14	2-14	3-14	4-14	5-14
chicken	baa-gwaakw-enh	'ba:k ^h a:k ^h wē: ^m	'b̥a:kɑ:k ^h wē: ^h	'b̥a:k ^h a:k ^h wē:	'b̥a:kɑ:k ^h wē:	'ba:k ^h a:k ^h wē:
horse	bezhgoogzhii (uncertain morphology)	'b̥e:ʒ ^o .go:g ^o .ʒi: ^h	'b̥e:ʒə.ḡo:ḡ.ʒi: ^h	'b̥e:ʒi.ḡo:ḡə.ʒi:	'b̥e:ʒ.ḡo:ḡ.ʒi:	'b̥e:ʒə.ḡo:ḡ.ʒi:
rabbit	waab-ooz		'wɑ:bo:s:	'wa:b̥o:s	wa:'b̥o:s:	wa:'b̥o:s:
	waab-ooz-onh	'wa:bo:zō: ^h	wa:bo:.'zō:	'wa:βo:zō:	wa:b̥o:.'zō:	'wa:b̥o:zō:
pig	goo-koosh	go:.'k ^h o:f:	ko:.'ko:f:	'ko:.'k ^h o:f:	'go:.'ko:f:	'go:.'k ^h o:f:
dog	nimosh	æ.ne:.'mɔf:	?æ.ne.'mɔf:			
			ne:.'mɔf:	'ne:mɔf:	ni.'mɔf:	ni.'mɔf:
	animosh-e		a.ne.mo.'ʃε ^h			
	nimoo-kaa-jiinh			ne.mo:k ^h a:.'tʃi:	ni.mo:ka.'tʃi:	ni.mo.'k ^h a:tʃi
raccoon	esban*	'e:z ^o .bʌn	'ʔe:zə.ban	'e:sə.ban	'e:z̥.bʌn	'e:z̥ə.bʌn
			'ʔe:zə.ban ^h			
muskrat	zhashk-onh	ʒʌ.ʃ:kō:	ʒa.'ʃkō:	ʌ.'ʒa.ʃ:kō:	ʒa.'ʃk ^h ō:	
	zhashk			ʒaʃ:k ^h		
fish	giigo-onh	'gi:ḡō: ^h	'gi:ḡō: ^h	'gi:ḡō:	gi:.'ḡō:	ə.'gi:γō:
bird	bne-shiinh	bɪ.ne:.'ʃi:	b̥ɪ.'ne:.'ʃi: ^h	b̥ɪ.ne:.'ʃi:	'b̥ne:.'ʃi:	b̥ɪ.ne:.'ʃi:
	bne-shiinhs	b̥ɪ.'n:.'ʃi:s:	b̥ɪ.'ne:.'ʃi:	b̥ɪ.'ne:.'ʃi:s:		
	bnēs					b̥ə.ne:s:
cow	bzhiki	bɪ.ʒi.'k ^h ε ^h	'b̥ʒi.k ^h ε ^h	b̥ə.ʒi.'k ^h ε:	b̥ʒi.'k ^h ε	b̥ʒi.'k ^h ε ^h

English Translation	Ojibwe Orthography	1-14	2-14	3-14	4-14	5-14
				bɪ.ʒi:.'kʰɛh		
cat	gaazhag	'gɑ:ʒʌkʰ:	'gɑ:ʒʌkʰ:	'kʰɑ:ʒʌkʰ:	ʃi.'gɑ:ʒɪk	'gɑ:ʒʌkʰ:
	gaazhag-enhs	gɑ:ʒʌ.'gɛ:s:	'gɑ:ʒʌ.gɛ:s:	kʰɑ:ʒʌ.'gɛ:s:	'gɑ:ʒ.gɛ:s:	'gɑ:ʒʌ.gɛ:s:
elephant	jejiibdak-iinh	ʃɛ:.'ʃɛi.bə.dʌ.kɪ:	'ʃɛ:.'ʃɛi.p:ta'kʰɪ:	ʃɛ:.'ʃɛi.bə.dakʰɪ:	ʃɛ:.'ʃɛi.bʰdʌ'kɪ:	'ʃɛ:.'ʃɛi.bə.'tɑ.'kʰɪ:
monkey literally: animal that picks lice	nda-maakme- shiih(s) (uncertain morphology)	nə.mɔ:.'kʰə.me:.'ʃi:ʰ	nda.'ma:kə.me:.'ʃi:	ɳ.də.'ma:kʰə.me:.'ʃi :s:	də.'ma:kʰme:.'ʃi:	ʒə.'ma:kə.me:.'ʃi:
turtle	mshiiik-enh	'pʃi:.'kʰɛ:	'pʃi:.'kʰɛ:	ɳ.ʃi:.'kʰɛ:	'pʃi:.'kʰɛ:	'pʃi:.'kʰɛ:
snake	gnebig	kɪ.'ne:.'bɪkʰ:	gɪ.'ne:.'bɪkʰ:	gɪ.'ne:.'bɪkʰ:	kə.ne:.'bɪkʰ:	gɪ.'ne:.'bɪkʰ:
wild goose/geese	ka		kʰɔʰ	ɳ.kʰɑ		
	ka-k	kʰakʰ:	kʰakʰ:	kʰakʰ:	kʰakʰ:	mə.'kʰakʰ:
eagle	mgizi	me.gɪ.'ziʰ	'me:.'gɛ.zɛ:ʰ		'me.gɪ.ʒɛ	mɪ.'gɪ.zɪ
						gʌ.'nu
river	ziibe	'zi:.'bɛʰ	'zi:.'bɛ:	ʒ.'zi:.'bɛ	'zi:.'bɛ	'zi:.'bɛ
tree	mtik	mɪ.'tʰɪkʰ:	'tʰɪkʰ:	ɳ.'tʰɪkʰ:	'tɪkʰ:	mə.'tʰɪkʰ:
						'tʰɪkʰ:
rock/stone	sin	a.'sɪn	'sɪn:	'sɪn:	'psɪn	'sɪn
snow	goon	ʌ.'gɔ:n	'gɔ:n	ə.'gɔ:n:	ə.'gɔ:n	'gɔ:n
					'gɔ:nʰ	

English Translation	Ojibwe Orthography	1-14	2-14	3-14	4-14	5-14
car	daabaan	'ḍa:ba:n	'ta:ba:n	ḍa:ba:n		'ḍa:ba:n
	daabaan-enhs				ḍa:ba:n.ɛ:s:	
boat/canoe	jiimaan	'ḍji:ma:n	'ḍji:ma:n	ḍji:.'ma:n:	ḍji:.'ma:n	ə.'ḍji:ma:n
small net	sa-b-iins	sʌ.'b̥i:s:	sʌ.'b̥i:s:	'sʌ.b̥i:s:	'sʌ.b̥i:s:	
net	sa-b			's:ʌp:h	's:ʌb̥	's:ʌp:h
strawberry	de-min	o.deo.'mɪn	o.'dɛ:.mɪn	'dɛu.mɪn	'dɛo.mɪn	ə.'dɛ:.mɪn
carrot literally: small rutabaga	jiis-enhs	ʌ.'ḍji:sɛ:s:	'ḍji:sɛ:s:	ə.'ḍji:sɛ:s:	'ḍji:sɛ:s:	'ḍji:sɛ:s
turnip/rutabaga	jiis					'ḍji:s:
orange (fruit)	ezaaw-min-gaanh*	?ɛ.'zau.mi.nɛ.gã:h	?o.'zã:mi.nɪ.gã:h	ɛ:.'zã:u.mi.nɪ.gã:h	'zãu.mɪn.'gã:	ɛ.'zã:mi.nɛ.gã:
potatoe(s)	pin	'pɪn:	'pʰɪn	'pʰɪn:	'pʰɪn	ʌ.'pʰɪn:
	pin-iik	pʰɪ.'ni:k:h	pʰɪ.'ni:k:h	pʰɪ.'ni:k:h	'pʰɪ.ni:k:h	ʌ.pʰɪ.'ni:k:h
raspberry(s)	msko-min	m̥.psko.'mɪn	'psko.mɪn	m̥p̥.'s:ko.mɪn	'psko.mɪn	psko.'mɪn:
	msko-mn-ag	m̥p̥.'sko.mi.'nak:h	'ks:kɔm.nan	m̥p̥.'s:kom.nak:h	'pskom.nak:	pskom.'nak:h
			'skom.nak:h			
apple	mshii-min	mi.'ʃi:i.mɪn	'pʰʃi:i.mɪn	m̥p̥.'ʃi:i.mɪn	'pʃi:i.mɪn	'pʃi:i.mɪn
shirt	bagwey-aan	'b̥ʌ.bo.ḡwe.ja:n	ba.bə.ḡo.'ja:n	'b̥ʌ.b̥ʌ.ʏoɪ.ja:n	'pʌ.ḡwan	'b̥ə.ḡo.ja:n
				'b̥ʌ.ḡoɪ.ja:n		
shoe(s)	mkizin	mi.kʰɪ.'zɪn	'kʰɪ.zɪn	mi.'kʰɪ.zɪn	'kʰɪ.zɪn'	'mɔk.zɪn

English Translation	Ojibwe Orthography	1-14	2-14	3-14	4-14	5-14
	mkizin-an		'pk ^h iz ^o .nan			mΛ.k ^h i.zi.'nan
hat	wiikwaan	wi:.'k ^h wɔ:n	Δ.'wi:k ^h wɑ:n	'wi:k ^h wɑ:n	wi:k.'wɑ:n	nə.'wi:k ^h .wɑ:n
pants	miiknoot	mi:k ^h ə.no:t ^h	mi:k ^h ə.no:t ^h	mi:k ^h .no:t ^h	'mi:k.no:t	mi:k ^h ə.no:t ^h
cupboard	taaswin	't ^h ɑ:.swin	't ^h ɑ:.s:win	't ^h ɑ:.s:win:	't ^h ɑ:.swin	'tɑ:.swin
cupboards	taaswin-an	't ^h ɑ:.swi.nan		t ^h ɑ:.s:wi.'nΛn		
spoon	emkw-aan*	'ʔem ^p .k ^h wan	'ʔem ^p .k ^h wɔn	'ʔem ^p .k ^h wɑ:n	'ʔe:m.kwɑ:n	'wem.kwɑ:n
	emkwaan-enhs			'ɛm ^p .kwa:nes:		
fork	bdak-jii'-gan	b̥ɛ.dΛ.kə.'ʔzi:ɡΛn	b̥ə.'dΛk ^o .ʔzi:ɡɔn	b̥ə.dΛ.kə.'ʔzi:ɡΛn	b̥ ^o dΛ.kə.'ʔzi:ɡΛn	b̥ə.'dΛ.kə.'zi.ɣΛn
pot/pail	kik	a.'k ^h ik: ^h	'k ^h ik: ^h	'k ^h ik: ^h	'k ^h ik: ^h	'k ^h ik: ^h
table	doop-win	'do:p.wim	'd̥o.p ^h wim:	'd̥o:φi.wim:	'do:p.wim:	'do:p ^h .wim
				'd̥o:p ^h .wim:		
chair	pab-win	p ^h ɑ.'.bwin	'p ^h ab.wim	p ^h Λp.'.win	'pΛ.bwin	'p ^h Λb.wim
door	shkwandem	'ʃkwan.dem	'ʃkwan.dem̥	'ʃkwan.dem	'ʃkwan.dem	'ʃkwan.dem
bell	ta-taa-gan	t ^h Λ.'.t ^h ɑ:ɡΛn	t ^h ɑ.'.t ^h ɑ:ɡΛn	t ^h Λ.'.t ^h ɑ:ɡΛn	ta.'.tɑ:ɡΛn	t ^h ɑ.'.t ^h ɑ:ɡΛn
	ta-taa-gan-enhs		t ^h ɑ.'.t ^h ɑ:ɡΛnɛs:			
soap	gziibiigni-gan	gzi:.'bi:kɪ.nɛ.ɣΛn	gzi:.'bi:.'kɪ.nan		'zi:.'bi:.'gnɛ:ɡΛn	zi:.'bi:.'ɣ ^o nɛ.ɡΛ
			gi.'zi:.'bi:.'kɛ.nɑ:n			
			gzi:.'bi:kɪ.nɑ.ɡɔn			
money	zhoon-ya	'ʒo.ni ^l .ja:	'ʒo:ni.ja: ^h	ə.'ʒo:ni.ja: ^h	'ʒo:n.ja:	'ʒo.ni.ja:

English Translation	Ojibwe Orthography	1-14	2-14	3-14	4-14	5-14
						ʒo ^w ε.nε:
six	ngodwaa-swi		kwə.ˈd̥oː.swe ^h			
	ngodwaa-swi		ŋ.gʌ.ˈd̥oː.swe ^h			
seven	niizhwaa-swi		ˈniː.ʒɔː.swe ^h			
eight	nshaa-swi		ˈʃːɔːswe ^h			
nine	zhaang-swi		ˈʒaːŋ.swe ^h			
ten	mdaa-swi		mə.ˈdaː.swe ^h			
moose	m-oos		muːs:			
turkey	mzise		mzi.ˈsɛː ^h			
barn owl	gaa-kaap-shiinh		gɑː.kɑː.ˈpʃiː ^h			
blue jay	gwiin-gwiish (Uncertain morphology)		gwiːn.ˈgwiːʃiː			
crow	aandek		ˈɔːnː.dekː ^h			
loon	maang		ˈmːɑːŋː			
bat	pashkwaanaa-jiinh uncertain morphology		pʌ.ˈʃkwaː.nɑː.ʃiː ^h			
butterfly	me-megw-aanh		mε.me.gwāː			
caterpillar	moose		ˈmuː.sɛː ^h			
spider	esbik-enh*		ˈʔεsː.ˈbɪ.kiː ^h ɛː ^h			

English Translation	Ojibwe Orthography	1-14	2-14	3-14	4-14	5-14
ants	eng-oonhs*		'ʔe:n.gõ:s:			
bread	bkwezhi-gan		k ^h we:ʒi.'gan:			
Home-made bread	mbijiiz-gan		bə.'ʤi:z.gan			
sugar	ziisbaakwad		zi:z ^o .ba:kod ^o			
butter	zaawaa-bmide		za:.'wap ^o mi.de: ^h	ə.'za: b ^o 'm:i.'de		
soup	nboop		nə.'bo:p: ^h			nə.'bo:p
						ʌn.'bu:p: ^h
cookies	pkwezh-gaans		pə.k ^h we.ʒə.'gã:s:			
eggs	waa-wan-oon		'wa: wɔ.nan:			
soda pop	men-waagm-ig		'mɛ: nə.wɔ: ga.mik: ^h			
banana	waagwey-aanh		'wɔ: gwe.jã: ^h			
grape(s)	zhoo-min		'ʒo: mɛn:			
	zhoo-mn-an		'ʒo: m.nan			
cherries	wiigwaas-min-an		wi:.'gwa:s: mi.nan			
blueberries	mii-nan		'mi: nan			
corn	mdaa-min		m ^o .'da: min			
drum	dewe-gan		'd ^o e: we.gan			
shaker	zhii-shiig-wan		'ʒi: ʃi: ywan			
stand up	naa-niib-win		na: ni:.'bwin			

English Translation	Ojibwe Orthography	1-14	2-14	3-14	4-14	5-14
sit down	n'madi-b-in		ni.'ma:.də.ɓɪn			
be quiet	be-kaa-yaan		be.k ^h ɑ:.'ja:n			
gold	ozaa-waa-zhooni-yaa			ə.za:ˠ.ɔ.ʒo:ni.yɑ:h		
ribbon	zenib-aanh			'ze:n.bõ:		
candy	ziisbaakod-ans			ʒi:z.ba:ɡə.dõ:s:		
fire	shkode			ʃkɔ.'de:h		

Table 11: Narrow Transcription Word List

Appendix C Broad Transcription of Words

The following table gives a list of the words and their word length that were considered for the Basic Word List and Extensions A and B. Not all of the words from the broad transcription were included in the final word lists but they are listed here in case the SLP needs to substitute certain words. The broad transcriptions are a representation of a possible production of the word and are not representative of all productions of the word. Use this word list with that in mind.

Record #	Orthography	IPA Target	Word Shape	Word Length
1	bezhik	^h be:ʒɪk	CVV.CVC	2
2	niish	^h ni:ʃ:	CVVCC	1
3	nswi	ns:wɛ	CCCCV	1
4	niiwin	^h ni:wɪn	CVV.CVC	2
5	naanan	^h na:nʌn	CVV.CVC	2
6	ozhaawshkwaa (nde)	ʒa:ʊ.ʃkwa:	CVVV.CCCVV	2
7	waabkshaa (nde)	wʌp.ʃka:	CVC.CCVV	2
8	mshkwaa (nde)	^h mshkwa:	CCCCVV	1
9	ngodwaaswi	ɡwə. ^h do:swe	CCV.CVV.CCV	3
10	niizhwaaswi	^h ni:ʒa:swe	CVV.CVV.CCV	3
11	nshaaswi	^h ʃa:swe	CCVV.CCCV	2
12	zhaangswi	^h ʒa:ŋ:swe	CVVC.CCCV	2
13	mdaaswi	mə. ^h da:swe	CV.CVV.CCCV	3
14	deh	^h de:h	CVV	1
18	binoojiinhs	bɪ.no: ^h ʒɪs:	CV.CVV.CVCC	3
19	gwiiwzenhs	ɡwi: ^h zɛ:s:	CCVV.CVVCC	2
20	kwezenhs	^h kwe: ^h zɛ:s:	CCVV.CVVCC	2
21	kwe	^h kwe:	CCVV	1
22	eknoomaaget*	ʔɛ.k ^h ɛ.no:ma:ɡɛ:	CV.CV.CVV.CVV.CVV	5
23	dinmanganan	dɪn.ma:ŋ.ɡʌn	CVC.CVVC.CVC	3
24	doon	^h do:n	CVVC	1

Record #	Orthography	IPA Target	Word Shape	Word Length
25	dip	dɪp:	CVCC	1
26	miinjisan	mi:n.ɕʝi.sʌn	CVVC.CV.CVC	3
27	wiibdan	wi:.bi.dʌn	CVV.CV.CVC	3
28	zidenhsan	zi.dē:.sʌn	CV.CVV.CVC	3
29	zid	'zit	CVC	1
30	jansh	'ɕʝã:ʃ:	CVVCC	1
31	tawagan	tʰʌ.'wək:	CV.CVCC	2
32	shkiizhik	ʃki:.ʔɪk:	CCVV.CVCC	2
33	kaat	'ka:t:	CVVCC	1
34	pichi	'pi.tʃi	CV.CCV	1
35	zhgaak	ʒə.'gɑ:k:	CV.CVVCC	2
36	amik*	ʔa.'mɪk:	CV.CVCC	2
37	aamoo*	ɑ:.mo:	VV.CVV	2
38	gaak	ə.'gɑ:k:	V.CVVCC	2
39	jidmoonh	ɕʝi.də.mõ:	CV.CV.CVV	3
40	gookookoo	'kʰo:.'kʰo:.'kʰo:	CVV.CVV.CVV	3
41	mkwa	mʌ.'k:wɔ:	CV.CCCVV	2
42	waawaashkesh	wɑ:.ʃkɛ:ʃ:	CVV.CCVVCC	2
43	waagosh	'wɑ:.gɔʃ:	CVV.CVCC	2
44	makki	mak:.ki:	CVCC.CCVV	2
45	zgime	zə.gɪ.me:	CV.CV.CVV	3
46	ma'iingan*	ma.i:ŋ:.gan	CV.VVCC.CVC	3
47	zhiishiibenh	ʒi:.ʃi:.'bē:	CVV.CVV.CVV	3
48	waabganoojiinh	'wɑ:.bə.gə.'no:ɕʝi:	CVV.CV.CV.CVV.CVV	5
49	baagwaakwenh	'bɑ:.ka:.kwē:	CVV.CVV.CCVV	3
50	bezhgoogzhii	be:ʒə.go:g.ʒi:	CVV.CV.CVVC.CVV	4
51	waabooz	wɑ:.bo:s:	CVV.CVVCC	2
52	googkoosh	'go:.'ko:ʃ:	CVV.CVVCC	2
53	nimosh	ne.moʃ:	CV.CVCC	2
54	esban*	'e:.zə.ban	VV.CV.CVC	3
55	zhashkohn	ʒɑ.ʃkɔ̃:	CV.CCCVV	2
56	gigoonh	'gi:.gõ:	CVV.CVV	2
57	bneshiinh	bi.ne:ʃi:	CV.CVV.CVV	3

Record #	Orthography	IPA Target	Word Shape	Word Length
58	bzhiki	bʒɪ.kɛ	CCV.CCV	2
59	gaazhag	ˈgɑː.ʒʌk:	CVV.CVCC	2
60	jejiibdakiinh	ʒeː.ʒiː.bə.da.kiː	CVV.CVV.CV.CV.CCVV	5
61	moos	ˈmuːs:	CVVCC	1
62	mzise	mzɪ.ˈsɛ	CCV.CCV	2
63	gaakaapshiinh	gɑː.gɑ:p.ˈʃiː	CVV.CVVCC.CVV	3
64	gwiingwish	gwi:n.ˈgwiːʃ:	CCVCC.CCVCC	2
65	aandek	ˈbɔːn.dek:	VVC.CVCC	2
66	maang	ˈmɑːŋ:	CCVCC	1
67	pashkwaanaajiih	bʌ.ʃkwaː.nɑː.ˈʒiː	CV.CCCVV.CVV.CVV	4
68	memegwaan	mɛ.mɛ.ˈgwiː	CV.CV.CCVV	3
69	moose	ˈmuː.sɛ:	CVV.CCVV	2
70	esbikenh*	ˈʔɛ.zə.bi.ˈkɛ:	CV.CV.CV.CCVV	4
71	engoonhs*	ˈʔɛ:n.gɔːs:	CVVC.CVVCC	2
72	bkwezhigan	kweː.ʒi.ˈgan:	CCVV.CV.CVCC	3
73	mbijiiigan	bə.ˈʒiːz.gan	CV.CVVC.CVC	3
74	ziisbaakwad	ˈziːz.baː.kɔːt	CVVC.CVV.CCVC	3
75	zaawaabmide	zɑː.ˈwɑbˈmi.de:	CVV.CVC.CV.CVV	4
76	nboop	nə.ˈbo:p:	CV.CVVCC	2
77	pkwezhgaans	pkwe.ʒə.ˈgɑːs:	CCCV.CV.CVVCC	3
78	waawanon	ˈwɑː.wɔ.nɑn:	CVV.CV.CVCC	3
79	menwaagmig	ˈmɛː.nə.wɔː.gɑ.mik:	CVV.CV.CVV.CV.CVCC	5
80	waagweyaanh	ˈwɔː.gwe.jɑː	CVV.CCV.CVV	3
81	zhoomin	ˈʒoː.mɛn:	CVV.CVCC	2
82	wiigwaasminan	wiː.ˈgwaːs.mi.nɑn	CVV.CCVCC.CV.CVC	4
83	miinan	ˈmiː.nɑːn	CVV.CVVVC	2
84	mdaamin	mɪ.ˈdɑː.mɪn	C.CVV.CVC	3
85	ndamaakmeshiinh	ndə.mɑː.kə.meː.ʃiː	CCV.CVV.CV.CVV.CVV	5
86	mshiikenh	ˈpʃiː.kɛ:	CCCVV.CCVV	2
87	gnebig	ɡɪ.ˈneː.bɪk:	CV.CVV.CVCC	3
88	kak	ˈkɑk:	CVCC	1
89	mgizi	me.ɡɪ.zɛ	CV.CV.CV	3
90	dewegan	ˈdeː.we.gan	CVV.CV.CVC	3

Record #	Orthography	IPA Target	Word Shape	Word Length
91	zhiishiigwan	'zi:ʃi:gwɑ:n	CVV.CVV.CCVVC	3
92	ziibe	'zi:be	CVV.CV	2
93	mtik	mi.'tik:	CV.CVCC	2
94	sin	's:ɪn	CCVC	1
95	goon	ə.'go:n	V.CVVC	2
96	daabaan	da:ba:n	CVV.CVVC	2
97	jiimaan	dʒi:mɑ:n	CCVV.CVVC	2
98	sabiins	sʌ.bɪ:s:	CV.CVVCC	2
99	demin	'de:mɪn	CVV.CVC	2
100	jiisenhs	'dʒi:sɛ:s:	CVV.CVVCC	2
102	pin	'pɪn	CVC	1
104	mshiimin	'pʃi:mɪn	CCCVV.CVC	2
105	bagweyaan	ba.bə.go.jɑn	CV.CV.CV.CVC	4
106	mkizinan	mi.kɪ.zɪn	CV.CV.CVC	3
107	wiikwaan	wi:kwa:n	CVV.CCVVC	2
108	miiknoot	mi:kə.no:t:	CVV.CV.CVVCC	3
110	emkwaan	'em.kwa:n	VC.CCCVVC	2
111	bdakjii'gan	bə.dʌ.gə.dʒi:ɡʌn	CV.CV.CV.CVV.CVC	5
112	kik	'kɪk:	CVCC	1
113	doopwin	'do:pwɪn:	CVV.CCVCC	2
114	pabwin	pʌ.bwɪn	CV.CCVC	2
115	shkwandem	'ʃkwɑn.dɛm	CCVC.CVC	2
116	tataagan	ta:tɑ:ɡʌn	CV.CCVV.CVC	3
117	gziibiignigan	ɡzi:.'bi:.'ɡnɛ.ɡʌn	CCVV.CVV.CCV.CVC	4
118	zhoonya	ʒo:ni.jɑ:	CVV.CV.CVV	3
119	naaniibwin	nɑ:ni:bwɪn	CVV.CVV.CCVC	3
120	n'madibin	ni.'ma:də.bɪn	CV.CVV.CV.CVC	4
121	bekaayaan	be.ka:.'ja:n	CV.CVV.CVVC	3
122	ozaawaazhooniyaa	ə.'za:ə.'ʒo:ni.yɑ:	V.CVV.V.CVV.CV.VVV	6
123	zenibaanh	'ze:n.bɔ:	CVVC.CVV	2
125	shkode	ʃkɔ.de:	CCV.CVV	2
126	taswin	'ta:swɪn	CVV.CCVC	2

Table 12: Broad Transcription Word List

Appendix D Word List Counts

D.1 Basic Word List Counts

Basic Word List Counts for Consonants

The following table provides the word counts for the consonants and consonant clusters produced in the Basic Word List found in Section 4.2.1.

	WI	WM	WF	
Consonant Singletons	m	6	4	1
	p(:)	3		2
	b	4	8	
	w	2		
	n	3	4	10
	t(:)	2	2	3
	d	2	3	
	s(:)	2	2	4
	z	3	3	
	ʃ		2	4
	ʒ	3	2	
	tʃ		1	
	dʒ	4	2	
	j		2	
	ŋ			1
	k	2	5	7
g	2	7		
Consonant Clusters	pʃ:	1		
	ʃk	1		
	ʃkw	1		
	bw		1	
	nd		1	
	ndʒ		1	

Table 13: Basic Word List Consonant Counts

Basic Word Counts for Vowels

The following table provides the word counts for the vowels produced in the Basic Word List found in Section 4.2.1.

		WI	WM	WF
Short Vowels	ɑ	1	7	
	ʌ		5	
	ɔ		2	
	ə	1	8	
	o		2	
	e		1	1
	ɛ		2	2
	ɪ		21	1
Long Vowels	ɑ:	1	8	
	o:		6	1
	e:	1	3	
	ɛ:			2
	i:		10	
Nasal/Nasalized Vowels	ã:		1	
	õ:		1	
	ẽ:			2
	ĩ:		2	2

Table 14: Basic Word List Vowel Counts

Basic Word List Counts for Word Shape/Word Length

The following table provides the counts for word shape and word length for the Basic Word

List. The list can be found in section 4.2.1.

		Total Number of each
Syllables	1	11
	2	20
	3	12
	4	1
	5	1
Most Frequent Word Shape(s)	CVVCC	3
	CV.CVVCC	3
	CVV.CVCC	3
Shortest word	CVV	1
	CVC	2
Longest word	CVV.CVV.CV.CV.CCVV	1

Table 15: Basic Word List Word Shape/Word Length Counts

D.2 Extension A Word Counts

Extension A Counts for Consonants

The following table provides the counts for consonants for Extension A word list. The list can be found in section 4.2.2

		WI	WM	WF
Consonant Singletons	m	2	4	
	p(:)			
	b	2	3	
	w	5	1	
	n		2	6
	t(:)	1		
	d	1	3	
	s(:)			3
	z	1	3	
	ʃ		1	1
	ʒ	3	2	
	tʃ			
	dʒ		2	
	j		1	
	ŋ			
	k		3	2
g		7		
Consonant Clusters	pʃk(:)		1	
	bʒ	1		
	gn		1	
	gw	1	1	
	gz	1		
	gʒ		1	
	kw	1	1	
	mšk	1		
	nm		1	
	ŋ(:)g		1	
	nd	1		
	ns:w	1		

	ŋsw		1	
	zb		1	
	ʃk	1	2	

Table 16: Extension A Consonant Counts

Extension A Counts for Vowels

The following table provides the word counts for the vowels in Extension A word list. The list can be found in Section 4.2.2.

		WI	WM	WF
Short Vowels	ɑ		3	
	ʌ		5	
	ɔ		1	
	ə		9	
	o			
	e		1	
	(?)ɛ	2	4	3
	ɪ		5	
Long Vowels	ɑ:		9	3
	ɒ:		1	
	o:		3	
	e:		3	
	ɛ:		4	
	i:		8	1
Nasal/Nasalized Vowels	ã:		1	1
	õ:		1	1
	ẽ:			1
	ẽ:		3	1
	ĩ:		2	
Diphthong	ɑʊ		1*	

Table 17: Extension A Vowel Counts

*Diphthongs are not part of the vowel system in Ojibwe. This production was likely conditioned by the environment.

Extension A Counts for Word Shape/Word Length

The following table provides the counts for word shape and word lengths for Extension A word list. The list can be found in section 4.2.2.

		Total Number of each
Syllables	1	2
	2	11
	3	4
	4	4
	5	4
Most Frequent Word Shape(s)	CCVV.CVVCC	2
Shortest word	CCCCV	1
Longest word	CVVC.CVV.CV.CVVCC	1
	CCV.CVV.CV.CVV.CVV	1

Table 18: Extension A Word Shape/Word Length Counts

D.3 Extension B Word Counts

Extension B Counts for Consonants

The following table provides the word counts for the consonants and consonant clusters produced in Extension B found in Section 4.2.3.

		WI	WM	WF
Consonant Singletons	m	3	4	
	p(:)			
	b	1	2	
	w	1	1	
	n(:)	1	1	10
	t(:)	1		
	d	3	2	
	s(:)		1	2
	z	1		
	ʃ			1
	ʒ	1		
	tʃ			
	dʒ	1		
	j			
	ŋ			
	k	1	1 k	2
g	1	2		
Consonant Clusters	kw	1	1	
	mshw		1	
	ng		1	
	k:k:		1	

Table 19: Extension B Consonant Counts

Extension B Counts for Vowels

The following table provides the word counts for the vowels in Extension B. The list can be found in Section 4.2.3.

		WI	WM	WF
Short Vowels	ɑ		2	
	ʌ		3	
	ɔ		1	
	ə	1		
	o		1	
	e	1	1	
	(i)ɛ	1	1	
	ɪ		3	
Long Vowels	ɑ:		7	
	ɒ:			
	o:		3	
	e:			
	ɛ:		1	1
	i:		4	1
	u:		1	
Nasal/Nasalized Vowels	ã:			
	õ:		2	
	ẽ:			
	ẽ:		1	1
	ĩ:			

Table 20: Extension B Vowel Counts

Extension B Counts for Word Shape/Word Length

The following table provides the word counts for the word shapes and word lengths produced in

Extension B found in Section 4.2.3.

		Total Number of each
Syllables	1	4
	2	13
	3	3
	4	0
	5	0
Most Frequent Word Shape	One representation of each word form	
Shortest word	CCVV	1
	CVVC	1
	CVCC	1
Longest word	CVV.CVV.CCVV	1

Table 21: Extension B Word Shape/Word Length Counts