A Test of French Phonology: Construction and Use

Un test de phonologie du français: construction et utilisation

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Abstract

Clinicians have had limited resources for conducting phonological evaluations of Canadian Francophone children and, to this day, there are no standardized tests of French-Canadian phonology (Brosseau-Lapré, Rvachev, Arcand, & Leroux, 2011). Recently, preliminary normative data were collected with a French screening tool in Québec, with results indicating that the screening tool is sensitive in identifying children with protracted phonological development (MacLeod, Sutton, Sylvestre, Thordardottir, & Trudeau, 2014). The current paper presents another new assessment tool for Canadian French phonology (developed for Manitoba French) to evaluate the segments and word structures of Canadian French phonology in depth within the context of a nonlinear phonological framework. The objectives of this article are: (a) to provide an overview of nonlinear phonology, and demonstrate how models of linear and nonlinear phonology account for non-adjacent segments, (b) to describe Manitoba French phonology, (c) to examine the phonological characteristics of the French word list (consonants, vowels, and word structures), and (d) to explain briefly how to administer, transcribe, and analyze data from the assessment tool.

Abrégé

Les orthophonistes ont peu d'options pour l'évaluation phonologique du français canadien chez les enfants et à ce jour il n'y a encore aucun test normé pour ce type d'évaluation (Brosseau-Lapré, Rvachew, Arcand, & Leroux, 2011). Récemment, une collecte de données préliminaires a été effectuée auprès des enfants francophones au Québec avec un outil français de dépistage de la phonologie et les résultats indiquent que l'outil est sensible pour identifier des enfants ayant des troubles de la phonologie (MacLeod, Sutton, Sylvestre, Thordardottir, & Trudeau, 2014). Ce rapport-ci présente un nouvel outil pour l'évaluation détaillée de la phonologie pour le français canadien (élaboré pour le français du Manitoba), dont la structure vise à couvrir l'inventaire complet des phonèmes et des structures de mots du français canadien, dans le cadre théorique de la phonologie non linéaire. Les objectifs du rapport sont : (a) de présenter un survol de la phonologie non linéaire et démontrer comment les modèles de phonologie linéaire et non linéaire expliquent les phénomènes impliquant des segments non adjacents, (b) de décrire, brièvement, la phonologie du français Manitobain, (c) d'examiner les caractéristiques phonologiques de la liste de mots français (les consonnes, les voyelles, et les structures du mot) et (d) d'expliquer brièvement comment administrer, transcrire et analyser les données du test.

Until recently, speech-language pathologists (S-LPs) have had limited resources for completing phonological assessments of Canadian French-speaking children and to this day, there are no standardized tests of French-Canadian phonology (Brosseau-Lapré, Rvachew, Arcand, & Leroux, 2011; MacLeod, Sutton, Sylvestre, Thordardottir, & Trudeau, 2014). Recently, a new screening tool for French phonology was piloted in Québec; results suggest that the screener is sensitive in identifying children with protracted phonological development (MacLeod et al., 2014). Another new tool was recently developed to facilitate more in-depth examination of children's phonology, e.g., in order to examine both simple and more complex syllable structures and to derive therapy goals. The current paper presents this new tool, which provides a detailed evaluation of the segments and word structure of Canadian French phonology within the context of a nonlinear phonological framework. Although initially developed for Manitoba French, this tool can be adapted to a variety of French dialects. The test is currently being used by S-LPs across Canada in a variety of contexts, including school boards, local community services, and private practice.

Nonlinear phonology framework

Both "linear" and "nonlinear" theories of phonology have been adopted for description of children's phonological development. As the name implies, "linear" phonological models describe phonological form along a single linear, rule-based plane (Chomsky & Halle, 1968). When a child's production differs from the expected adult target, linear accounts can explain patterns only in terms of neighbouring segments (consonants or vowels). However, when patterns occur between distant (non-adjacent) segments, linear models are unable to explain the pattern without recourse to complex sets of rules. Nonlinear phonological analyses (e.g. Goldsmith, 1976), departing from older rule-based generative phonology, can account for distant interactions through invoking a hierarchical framework of autonomous elements. If two consonants are not surface-adjacent, they may still be adjacent on a different plane. For example, consonants separated by vowels can be adjacent on a consonant tier, which is independent of a vowel tier (See also Bernhardt & Stemberger, 1998; Bernhardt & Zhao, 2010; Prince & Smolensky, 1993).

Nonlinear phonological models have two major tenets: hierarchical representation, and autonomy of phonological elements. In terms of hierarchy, each phonological element (consonant, vowel, parts of the syllable, the entire syllable, the foot, and the prosodic word) is situated in on its own level or tier, from the phrase level at the top of the hierarchy to the features at the bottom (see Figures 1 and 2). For example, the word bol ('bowl') contains a foot (bol), a syllable (bol), an onset (/b/) and a rime (/ɔl/), itself composed of a nucleus (/ɔ/), and a coda (/l/). The syllable bol contains three segments (/b/, /ɔ/ and /l/) and each segment comprises features that are organised according to a hierarchical geometry (referred to 'feature geometry') (see Figure 2). For example, the segment /b/ is composed of the following features grouped by node type: [+ consonantal], [- continuant] (manner of articulation node), [Labial] (place of articulation node), [+ voiced] (Laryngeal node).

In terms of autonomous representation, each of the levels of the hierarchy is considered to be independent, but linked to certain other levels (as can be seen in the feature diagram). Speech output can reflect patterns within one autonomous level, or interactions between multiple levels of hierarchical geometry (Bernhardt &
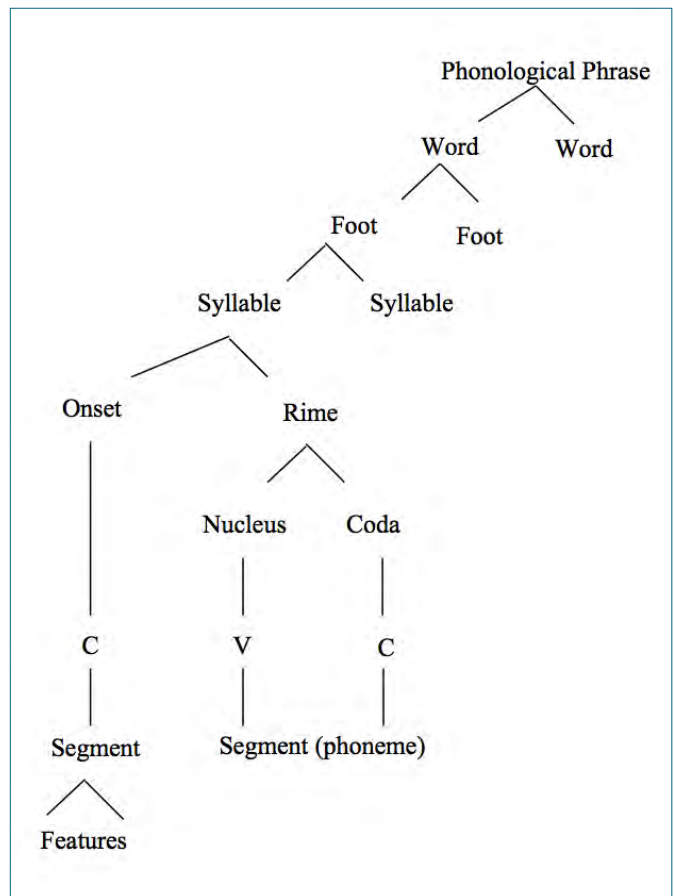

Figure 1. Hierarchical representation of phonological form from the feature to the phonological phrase.
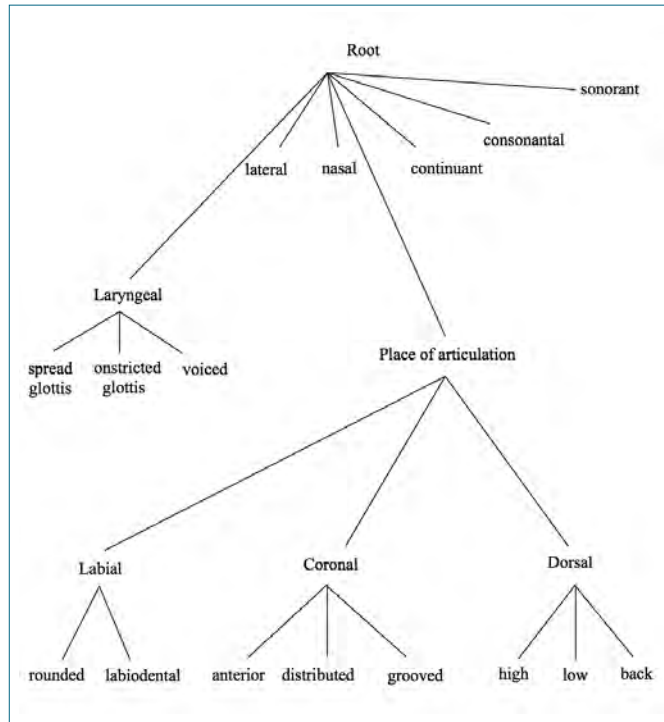
Figure 2. Hierarchical feature geometry, from the root (manner) to the place of articulation.

Stemberger, 1998; Bernhardt & Zhao, 2010). The following examples illustrate how hierarchical and autonomous representations in nonlinear (NL) phonology account for certain patterns, and the limitations of linear (L) rule-based phonology (see Table 1).

In examples 1 and 2, the words *étoile* and *hippopotame* show an interaction between coronal and labial consonants. In the word *étoile*, the two consonants (/t/ and /w/) are immediately adjacent (i.e., adjacent at the surface level) and the interaction is easily explained in both frameworks; however, in *hippopotame*, the two consonants (/t/ and /p/) are separated by a vowel and therefore are not adjacent at the surface level. Linear explanations cannot easily account for the interaction of two consonants when a vowel intervenes. In contrast, nonlinear phonology, based on hierarchical representations, allows separation of consonants and

Table 1. Nonlinear (NL) and linear (L) accounts for hierarchical and autonomous representations within speech productions.

| Adult target	Child's production	Description (explanation)
1. /éˈtwal/ étoile 'star'	[eˈpwal]	A target sequence of a [Coronal] (/t/) and a [Labial] (/w/) cannot be produced. Thus, the stop is produced as a [Labial]. NL and L frameworks are equally capable of explaining the pattern succinctly.
2. /ʔipɔpɔˈtam/ *hippopotame* 'hippopotamus'	[ʔipɔpɔˈpam]	A target sequence comprised of a [Labial] (/p/) and a [Coronal] (/t/) cannot be produced. The second stop is therefore also produced as [Labial]. NL: The two consonants are adjacent on their own independent level, and must share the same place of articulation, in this case, [Labial]. L: Because the consonants are not adjacent at the surface level, a linear rule-based explanation would require a series of complex and arbitrary rules to account for the distant interaction.
3a) /kɔˈʃɔ̃/ *cochon* 'pig' 3b) /mɔ̃ˈtaŋ/ *montagne* 'mountain'	[kɔˈʃɔ̃] [ˈtaŋ]	NL: The more complex nasal vowel is only possible in a stressed part of a foot. Thus, there is deletion of the unstressed syllable when it contains a nasal vowel. Both the syllable and vowel are produced in the word *cochon*, where the nasal vowel is in a stressed syllable. Syllable prominence interacts with segmental content. L: Again, linear phonology would require a series of complicated rules, resulting in an arbitrary contrast between *cochon* and *montagne* or simply a designation of inconsistency.
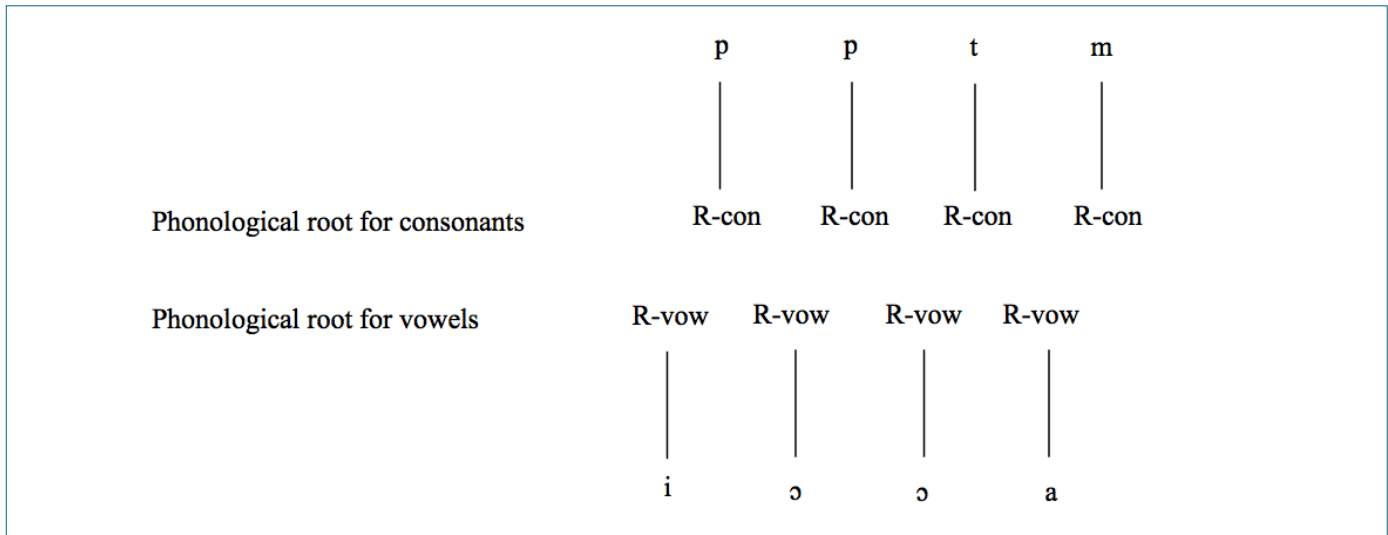
Figure 3. Nonlinear representation of consonant and vowel planes, with the root nodes of consonants and vowels on different non-adjacent planes.

vowels onto two different planes, with the assumption that the consonants are then immediately adjacent to one another (Bernhardt & Stemberger, 1998). Because vowels are represented on a separate plane, they do not interfere in the interaction between the consonants /t/ and /p/ (see Figure 3). Another type of interaction between prosodic and segmental levels of representation, are illustrated in the contrasting productions of *cochon* (3a) and *montagne* (3b). The more complex nasalized vowels are produced in a prominent (stressed) syllable (*cochon*) but not in a weaker, non-prominent syllable. The initial non-prominent syllable in the word *(mon)tagne* fails to surface, with subsequent deletion of the nasal vowel (and the word-initial consonant).

Word lists for the evaluation of a child's phonology must take into account potential interactions between segmental features (place, manner, and laryngeal), and the prosodic structure of a word (word length, syllable prominence, word shapes in CV sequences). In addition, the word list must provide rich and varied contexts for each target phoneme (Bernhardt & Stemberger, 1998; James, van Doorn, & McLeod, 2007; Kehoe, 2001; Morgenstern et al., 2010). In order to determine what would be relevant for a test of Canadian French phonology, the phonology of Canadian French (more specifically, Manitoba French) is described briefly below.

Overview of Manitoba French phonology

Canadian French is the dominant language in the province of Québec, and a minority language in all other provinces. This paper focuses primarily on Manitoba French, a variant spoken by more than 47,000 individuals. The majority of speakers reside in the Winnipeg area, but there are also small Francophone communities throughout the province (Statistics Canada, 2011). Most research on Canadian French has been conducted in Québec and Ontario. Only a very limited number of studies have described Manitoba French phonology (Hallion-Bres, 2000; Marchand, 2004). The most current data on Manitoba French are presented here, with gaps in the literature complemented by research from other provinces, respecting regional dialect differences. Most Franco-Manitobans are bilingual (French-English), which results in some speech characteristics being a result of interactions between French and English. While the influence of bilingualism on speech production is important, the topic of bilingualism exceeds the scope of this article.

Consonants

Manitoba French has 21 consonants, including 6 stops, 3 nasals, 7 fricatives, 3 glides, and 2 liquids (see Table 2).

Following a feature framework derived from Bernhardt & Stemberger (1998), consonants are grouped as follows (non-contrastive redundant features are noted in parentheses):

Manner of Articulation

1. Stops: [-continant, -sonorant] ([+consonantal]): /p, t, k, b, d, g/

2. Nasals: [+nasal] ([+consonantal, -continuant, +sonorant]): /m, n, {ŋ/ɲ}/

Table 2. Manitoba French consonants, organized by manner and place of articulation

	Labial		Coronal			Dorsal	
		[+labiodent]	[+anterior] (alveolar)	[−anterior]		[+high] (velar)	[−high], [−low] (uvular)
Stops	p		t d tsᵃ dzᵃ			k g	
[−continuant]	b						
Nasals	m		n		(ɲ)	ŋ	
[+nasal]							
Fricatives		f v	s z	ʃ ʒ			ʁ
[+cont,−son]							
Glides	wᵇ			ɥᵇ	j	wᵇ jᵇ	
[−cons]	ɥᵇ						
Liquids							
[+lateral]			l				
[+rhotic]			(r)				ʀ

Note. Adapted from Walker (1984), with feature framework from Bernhardt and Stemberger (1998). [cont]=[continuant], [cons]=[consonantal], [son]=[sonorant], [labiodent]=[labiodental]. The parentheses indicate a possible variant for certain speakers/contexts.
ᵃ The affricates are [+strident] allophones of the /t/ et /d/ stops and could be characterized as [−continuant, +continuant].
ᵇ The glides are designated with two places of articulation.

3. Glides: [-consonantal] ([+sonorant, +continuant]): /w, ɥ, j/

4. Fricatives: [+continuant, -sonorant] ([+consonantal]): /f, v ,s, z ,ʃ , ʒ, (ʁ - rhotic variant)/

5. Affricates: [-continuant, +continuant], or [-continuant, +strident] ([+consonantal], [-sonorant]): [ts, dz] (allophones of /t, d/)

6. Liquids:

   a. [+lateral] ([+consonantal, +sonorant, ?continuant]): /l/

   b. [+trilled] ([+consonantal, +sonorant, +continuant]): /r, ʀ/ (see rhotic productions in the following section)

Place of Articulation

1. [Labial]:

   a. [Labial] only: /p, b, m/

   b. [+round]: /w, ɥ/

   c. [+labiodental]: /f, v/

2. [Coronal]:

   a. [+anterior]: /t, d, n, l, s, z, (r)/

   b. [-anterior]: /ʃ, ʒ, ɥ, j, (ɲ)/

   c. [+grooved]: /s, z, ʃ, ʒ/

   d. ([-grooved]: /t, d, n, l, (r)/

3. [Dorsal]:

   a. [+high]: /k, g, ŋ/

   b. [-high, -back]: /(ʁ)/ (see rhotic productions in the following section)

4. [Labial]-[Dorsal]: /w/

5. [Coronal]-[Dorsal]: /j, ɲ/

6. [Labial]-[Coronal]: /ɥ/

Laryngeal (all [-spread glottis])

1. [+voiced]: /b, d, g, v, z, ʒ, (ʁ)/ (the /ʁ/ segment is produced by some speakers)

2. [-voiced]: /p, t, k, f, s, ʃ/

Consonant patterns in Manitoba French

Canadian French shows a number of alternative patterns concerning consonants (see Baligand, 1995; Hallion-Bres, 2000; Walker, 1984 for a complete description). The focus in this section is on Manitoba French (for which the test was originally devised) but additional information is presented on French in other provinces where there are gaps concerning Manitoba French.

1. Rhotics: Manitoba French has only one rhotic consonant, although variations in allophonic productions have been noted for the same speaker and for speakers across the province. For example, Hallion-Bres (2000) observed that the voiced apical trill /r/ is produced by older-speaking Manitobans, while the voiced uvular fricative /ʁ/ and voiced uvular trill /ʀ/ are found in an increasing proportion in younger speakers. Moreover, the uvular fricative /ʁ/ is often devoiced ([-voiced]) in syllable-final coda position, e.g., *tracteur* [tʁakˈtœʁ] ('tractor'), or between vowels (intervocalic), e.g., *perroquet* [pɛʁɔˈkɛ] ('parrot').

2. Affrication: Similar to most dialects of Ontario and Quebec French, Franco-Manitobans show assibilation of coronal stops that precede high front vowels (tense and lax) /i, ɪ, y, ʏ/ and glides /ɥ, j/, e.g., *tuque* [tsʏk] ('toque'); *crocodile* [kʁɔkɔˈdzɪl] ('crocodile'). In Manitoba French, affrication appears to occur both within words and across word boundaries, e.g., *huit hippopotames* as [wɪtsipɔpɔˈtam] ('eight hippopotami').

3. [h] and aspiration:

   a. Debuccalization of lingual fricatives: Production of [h] for fricatives /ʃ/ and /ʒ/, is a rare occurrence in Manitoba French; however, some examples have been documented, especially for /ʒ/, e.g., *toujours* [tʏˈʒuʁ] ~ [tʏˈhuʁ] ('always').

   b. Orthographic 'h': Although orthographic 'h' is usually silent, Franco-Manitobans (and some speakers of Alberta French dialects) have been observed to pronounce onset [h] in certain words, e.g., *hiver* [hiˈvɛʁ] ('winter'), and *dehors* [dəˈhɔʁ] ('outside') (Hallion-Bres, 2000; Rochet, 1994; Rose & Wauquier-Gravelines, 2007; Walker, 1984). According to existing Manitoba data, the production of 'h' is not

Table 3. Manitoba French vowels and features.

Features	[+tense]	[-tense]	[+nasal]
Labial [+round]	y ø u o ɔ œ̃ ɔ̃	ʏ œ œ	œ̃ ɔ̃
Coronal [+front]	i e (a) y ø ɛ̃ œ̃	i ɛ ʏ œ œ	ɛ̃ œ̃
Dorsal [+back]	u o ʌ ɑ ɔ̃ ã	ə ɔ	ã ɔ̃
Dorsal [+high]	i y u	ɪ ʏ	
Dorsal [-high][-low]	e ø o ɛ̃ œ̃ ɔ̃	ɛ œ ɔ	ɛ̃ œ̃ ɔ̃
Dorsal [+low]	a/ɑ	œ	ã

Table 4. Frequency of vowels in stressed and unstressed positions in the Manitoba French word list.

Dialect		ə	a	ɑ	o	ɔ	u	e	ɛ	ɛᴵ	i	ɪ	ø	œ	ʌ	ʊ	ʏ	y	õ	ã	ɛ̃	œ̃
Manitoba	Stressed	0	18	4	6	4	3	4	15	5	6	4	3	5	2	1	6	2	6	5	5	2
	Unstressed	3	18	4	2	16	3	6	3	0	11	1	1	0	5	0	0	3	3	6	2	0

systematic and varies across speakers and demographic regions (Hallion-Bres, 2000).

c. Aspiration: Similar to French Acadians, Franco-Manitobans may aspirate voiceless lingual stops as in English, e.g., *cadeau* [kʰa'do] ('gift') (Hallion-Bres, 2000; Peronnet, 1995).

4. Elision of consonants occurs in many contexts in Manitoba French:

a. Elision of /l/: In determiners *le* and *la* ('the'), /l/ elision has often been documented for Manitoba French, e.g. *met la table* [mɛla'tab] ~ [mɛa:'tab] ('set the table'). Instances of /l/ deletion are also found in intervocalic consonants and clusters, e.g., *balançoire* [balã 'swaʁ] ~ [baã:'swaʁ] ('swing').

b. Elision of /v/: The /v/ can also be deleted intervocalically, e.g., *hiver* [ʔi'vɛʁ] ~ [ʔi'ɛʁ] ('winter'), or in initial clusters when preceding glides, e.g., *voiture* [vwa'ʦyʁ] ~ [wa'ʦyʁ] ('car').

c. Deletion of word-final consonants: Similar to other French Canadian dialects, Manitobans often delete word-final consonants when they follow a [-sonorant] consonant. This deletion is observed in sequences of diconsonantal clusters such as *dentiste* [dã 'tɪst]~[dã 'tɪs]('dentist'), and, by extension, deletion of two consonants in words that end in triconsonantal clusters, e.g., *monstre* /'mɔ̃ stʁ/~/'mɔ̃ s/('monster').

Vowels

Manitoba French has a rich vowel system that includes 16 oral vowels and four nasalized vowels (/ɛ̃ œ̃ ã ɔ̃/) (see Tables 3 and 4).

Vowel patterns in Manitoba French

Nasal Vowels

1. /ɛ̃/ versus /œ̃/: Like other Western Canadian dialects, but unlike European French dialects, Manitoba French has a contrast between /ɛ̃/

and /œ̃/ (Larivière, 1994; Rochet, 1994). The /ɛ̃/ is described as more tense than in other French Canadian dialects (Hallion-Bres, 2000).

2. /ã/-[ã]: A variant of /ã/, i.e., [ã] (more anterior) is typically produced in open stressed syllables (Hallion-Bres, 2000).

3. Neutralization: Two types of neutralization have been observed (Hallion-Bres, 2000):

   a. For some Manitoba French speakers, /ã/ neutralizes to [ɛ̃], although not to the same degree as in Canadian dialects such as Acadian French (Peronnet, 1995).

   b. In some Manitoba speakers, /ɔ̃/ neutralizes to [ã], especially when the word contains another /ã/ (Hallion-Bres, 2000).

4. Diphthongs: Similar to other French Canadian dialects, nasalized vowels in Manitoba French can be diphthongized, especially in closed stressed syllables. Thus, words such as *lampe* /'lãp/ ('lamp') or *ongle* /'ɔ̃gl/ ('nail') may be produced as ['lãũp] and ['ɔ̃ʊgl] (Hallion-Bres, 2000).

5. Denasalization: In some regions of Eastern Manitoba (e.g., Ste.-Rose du Lac), adult French speakers denasalize certain nasal vowels, especially /ã/. Denasalization can occur both within single word utterances and across word boundaries, but nasal vowels in open syllables appear to be especially sensitive to this variation, e.g., *fontaine* [fɔ̃'tɛ] ~ [fɔ'tɛn] ('fountain') Hallion-Bres, 2000).

Oral Vowels

Oral vowels in Manitoba French behave similarly to those of other French-Canadian dialects (Hallion-Bres, 2000).

1. Laxing of high vowels: In some speakers, high vowels (/y, i, u/) are produced as lax variants (Hallion-Bres, 2000):

   a. In stressed closed syllables when the coda is voiced, e.g, toujours /tʏ'ʒuʁ/ ~ [tʏ'ʒʏʁ] ('always').

   b. In stressed open syllables, e.g., vivre /'vi/ ~ ['vɪ] ('to live').

2. Devoicing/elision: Vowel devoicing, or deletion of

vowels, can occur intervocalically (Hallion-Bres, 2000), especially in two contexts:

   a. Between two voiceless consonants, either in continuous speech or in single word utterances. The vowel may be completely deleted, e.g. assistant /asi'stã/ → [asɪ̥'stã] ~ [as:'tã] ~ [as'tã] ('assistant').

   b. For high stressed vowels, between two voiced continuant consonants, e.g., disons /dzi'zɔ̃/ → ['dzɔ̃] ('let's say'), or vous avez /vu.za've/ → [vza've] ('you have').

3. Diphthongs: Based on the Hallion-Bres (2000) corpus, oral vowels can become diphthongized only in stressed syllables. For example, icône /i'kon/ → [i'koʊn] ('icon').

Word List Development for the French Phonology Test

French is one of 14 languages in a crosslinguistic study of preschoolers' phonological development (both typical and protracted). For each language, a single-word elicitation tool has been constructed that is representative of the phonology of the language. Grunwell (1985) recommended samples of at least 100 words for English phonological assessment, in order to allow a comprehensive analysis of word structures and segments. Word lists for both Manitoba French and Standard French (Almeida, 2013) have been constructed. The Manitoba version is applicable, however, across a number of Canadian dialects. A 111-word list was created, meeting the following criteria:

   a. Comprehensiveness: Each segment of the language is targeted at least twice (once in a stressed syllable and once in an unstressed syllable) in a variety of contexts in terms of word structure and length. The proportion of segments reflects their frequency in French. For example, there are more /s/ and /k/ consonants than /z/ and /ʒ/ consonants (New & Pallier, 2001).

   b. Familiarity and imageability: Words of the elicitation tool are familiar to children and can be represented by colour images/photos. A few words were selected from existing word lists, such as the *Protocol expérimental de l'Université de Montréal* (Bergeron, 1982) and the Nouvelle épreuves pour l'examen du langage (Chevrie-Muller & Plaza, 2001). Additional words were selected on the basis

of how familiar they would be to Manitoba French speakers, while considering word length and complexity. Most words are found in the *Inventaires MacArthur du Développement de la Communication* (Boudreault, Cabriol, Trudeau, Poulin-Dubois, & Sutton, 2007). The majority are nouns, with a few verbs, adverbs, and adjectives.

c. Efficiency: In preliminary testing, the speech-language pathology researchers found the test to take approximately 20 to 30 minutes. For some children with more severely protracted speech development or who are less familiar with some of the words, the test can take up to 40 minutes to complete.

Table 5. Word shape, frequency (ordered by word length) and targeted words in the Manitoba French word list (with English translation).

Word shape	#	Targeted words	English Translation of Targeted words
Monosyllabic			
CVC	20	Bol, Bulle, Phoque, Jambe, Langue, Lampe, Lave, Neige, Pomme, Peigne, Rêve, Robe, Rouge, Singe, Soupe, Tête, Tasse, Tuque, Vache, Vague	Bowl, Bubble, Seal, Leg, Tongue, Lamp, Clean, Snow, Apple, Comb, Dream, Dress, Red, Monkey, Soup, Head, Cup, Toque, Cow, Wave
CCV	8	Bien, Bleu, Brun, Chien, Doigt, Noix, Nuit, Roi	Good, Blue, Brown, Dog, Finger, Nut, Night, King
CV	7	Queue, Feu, Gant, Lait, Nez, Zoo	Tail, Fire, Glove, Milk, Nose, Zoo
CCVC	6	Cloche, Clown, Fleur, Fraise, Plume, Soif	Bell, Clown, Flower, Strawberry, Feather, Thirsty
CVCC(C)	3	Livre, Zèbre, Monstre	Book, Zebra, Monster
VCC	2	Ours, Ongle	Bear, Nail
CCVCC	1	Triste	Sad
CVV	1	Jouet	Toy
VC	1	Oeuf	Egg
VCCC	1	Arbre	Tree
V	1	Un	One
Disyllabic			
CV.CVC	11	Chandelle, Fontaine, Gorille, Girafe, Montagne, Mouffette, Musique, Saucisses, Salade, Tomate, Valise	Candle, Fountain, Gorilla, Giraffe, Mountain, Skunk, Music, Sausages, Salad, Tomato, Suitcase
CV.CV	9	Cadeau, Cochon, Des oeufs, Gâteau, Lapin, Maison, Nager, Robot, Cheveux	Gift, Pig, Some eggs, Cake, Rabbit, House, Swim, Robot, Hair

CCV.CV	4	Drapeau, Piano, Plonger, Poisson	Flag, Piano, Dive, Fish
CCV.CVC	4	Glissade, Grenouille, Princesse, Voiture	Slide, Frog, Princess, Car
CVC.CVC	4	Cache-cache, Casquette, Docteur	Hide-and-go-seek, Cap, Doctor
CVC.CV	2	Tortue	Turtle
CV.CCVC	2	Lumière, Citrouille	Light, Pumpkin
V.CVC	2	Échelle, Hiver	Ladder, Winter
CV.CCVC	1	Camion	Truck
CV.V	1	Jouet	Toy
V.CV	1	Hibou	Owl
CV.VC	1	Nuage	Cloud
CCV.V	1	Bleuet	Blueberry
CCVC.CVC	1	Tracteur	Tractor
V.CCVC	1	Étoile	Star
CVC.CCVC	1	Sorcière	Witch
CVC.CCV	1	Biscuit	Cookie

Multisyllabic

CV.CV.CV	6	Kangourou, Chocolat, Champignon, Cheminée, Magasin, Perroquet	Kangaroo, Chocolate, Mushroom, Chimney, Store, Parrot
V.CV.CV	2	Araignée, Éléphant	Spider, Elephant
V.CV.CVC	2	Écureuil, Hôpital	Squirrel, Hospital
CV.CV.CCVC	2	Balançoire, Dentifrice	Swing, Toothpaste
CV.CV.CVC	1	Dinosaure	Dinosaur
CVC.CV.CV	1	Restaurant	Restaurant
CCV.CV.CVC	1	Crocodile	Crocodile
VCC.V.CCVC	1	Arc-en-ciel	Rainbow
V.CV.CV.CVC	1	Hippopotame	Hippopotamus

This clinical tool is designed to be suitable for children between the ages of 3 to 9 years. In order to identify children with protracted phonological development across the age span, the test includes a variety of word lengths, including multisyllabic words and both earlier- and later-acquired segments (e.g., bilabials versus coronal fricatives). The S-LP can select words from the list according to the child's speech development.

Phonological Characteristics of the Manitoba French Word List

The following section provides a detailed description of the Manitoba French word list characteristics, in terms of prosodic structure (intonation, stress, word length, and syllable structure), consonants and vowels (see Table 5), and phonotactic considerations concerning structure and segments.

Prosodic structure: Intonation, Stress, Word Length, and Syllable Structure

Intonation in French is used almost exclusively to express syntactic information such as the difference between a declarative and an interrogative utterance. Declarative sentences are displayed by final lowered intonation; by contrast, interrogative sentences are characterized by a final rising intonation (Lacheret-Dujour & Beaugendre, 2002). The French phonology test is designed as a single word elicitation using a cloze technique with utterance-final declarative intonation; thus, intonation is neutral with respect to the targets.

French is considered a syllable-timed language, i.e., the syllable is the rhythmic unit of the prosodic structure (Wenk & Wioland, 1982). A single internal stress is regularly assigned to the final syllable in a prosodic phrase that may contain one or several words. In early language development, French-speaking children tend to produce words with only one binary foot (two syllables), often reduplicants, where the final stressed syllable is repeated (Demuth & Johnson, 2003; Rose, 2000): e.g., porte-monnaie /pɔʁtmɔ'nɛ/ as [nɛ'nɛ] ('wallet'). Trisyllabic words tend to be truncated to disyllabic words (Demuth & Johnson, 2003; Rose, 2000).

In terms of word length, studies indicate that about 50% of the words of francophone children are disyllabic, 33% are monosyllabic (primarily CV and CVC), and the remaining 17% of words are multisyllabic (three or four syllables: Demuth and Johnson, 2003; Rose, 2000). The current word list generally matched these proportions, with 43% monosyllabic words, 42% disyllabic words, and 15% multisyllabic words (slightly more monosyllabic words than the reported frequency).

The variety of word lengths allows observation of interactions between word length, stress, and consonant/vowel production. For example, as noted earlier, a child may be able to produce the nasal vowel /ɔ̃/ in a stressed syllable, e.g., in cochon /kɔ.'ʃɔ̃/ ('pig'), but not in the initial unstressed syllable of a word such as montagne /mɔ̃.'taɲ/ ('mountain'). Thus, at least one token of every French consonant and vowel was elicited in both stressed and unstressed positions.

Table 6. Frequency of consonants in the Manitoba French word list, by position, manner, and place of articulation.

	Stops						Nasals			Fricatives						Glides				Liquids		Clusters
	p	b	t	d	k	g	m	n	ŋ	f	v	s	z	ʃ	ʒ	ʁᵃ	w	ɥ	j	l	ʁ/r	
Initial	3	4	4	3	7	3	6	4	-	3	3	6	2	4	3	-	-	-	-	7	5	29
Medial																						16
Syllable-initial	6	2	8	2	5	2	2	4	2	2	2	4	5	2	2	-	-	-	-	4	6	
Syllable-final				2											1						3	
Final	2	2	4	2	3	2	3	2	2	3	2	4	2	3	4	9	-	-	4	8	-	8
Total	11	8	16	7	17	7	11	10	4	8	7	14	9	10	9	9	-	-	4	19	14	53

ᵃ For certain speakers, the rhotic is produced as /ʁ/.

French has many possible word shape combinations (CV sequences), including open and closed syllables. In monosyllabic words the most common word shapes are: CV, CVC, CCV(C), CVCC and (C)VC(C) (New & Pallier, 2001; Sprenger-Charolles & Siegel, 1999). Word shape frequency data are lacking for disyllabic and multisyllabic words in French (Rose & Wauquier-Gravelines, 2007; Stokes, Kerns, & Dos Santos, 2012); however, the majority of disyllabic words for this test are common words found in the *Inventaires MacArthur du Développement de la Communication* (Boudreault et al., 2007) with CVCV, CCVCV and VCV word shapes.

The word list (see Table 4) contains a representative sample of the word shapes of French-speaking children. The majority of monosyllabic words in the list include the following word shapes: CVC and CCV(C), with a few CV(C) and (C)VC(C) words. The majority of disyllabic words consist of CVCV, CVCVC, CCVCV(C) and CVCCV(C) words. Thus, the test includes a variety of word shapes representative of the structure of French, both in terms of the number of syllables and in terms of the word shapes in CV sequences. The word list also includes 17 multisyllabic words with a variety of word shapes.

Consonants and vowels

As demonstrated in Tables 4 and 6, the word list includes the complete set of consonants and vowels in French in each word position (in accordance with French phonotactics, as discussed below).

Words were selected with a variety of consonant place and manner sequences, thus providing an opportunity to examine sequence-based phonological patterns, such as metathesis, assimilation, epenthesis, and coalescence. For example, the consonants in the word *grenouille* /gʁəˈnuj/ ('frog') includes a manner sequence of stop-liquid-nasal-glide and a place sequence of dorsal-uvular-coronal-[coronal-dorsal].

Administering the Test

Test administration comprises two steps: first, a short familiarization ('warm-up') phase (with objects or photos) and then a presentation of the photos for the full word list. A puppet named Julie can be used to encourage children to participate and follow along during test administration.

As noted, the test begins with 10 objects or photos. In addition to providing a 'warm-up' activity for the child, the words provide a larger sample of low frequency phonemes (for example, /z/, /ʃ/, /ŋ/) targeted in the following words: *éléphant* ('elephant'), *kangourou* ('kangaroo'), *zoo* ('zoo'), *fraise* ('strawberry'), *champignon* ('mushroom'), *chandelle* ('candle'), *rêve* ('dream'), *glissade* ('swing'), *vague* ('ocean wave'), and *cheveux* ('hair'). Because these words appear again in the full test, they can provide a set of data for evaluating consistency of production. This is especially important for the multisyllabic words, which are more vulnerable during development because they are less frequent, less practiced and contain many interacting phonological elements (Bérubé, Bernhardt, Mason, & Stemberger, 2014; Kehoe, 2001).

The second phase of the test involves the full picture elicitation (available free from the authors). The pictures are organized by themes in four different stories (animals, restaurant, things around the house), and are presented in a binder or electronically through a slide presentation. Each picture corresponds to one target word, with three to five pictures per page (although this can be modified to present fewer items per page).

Administration of the word list (familiarization set and full word list) is similar. Throughout the test, a doll or puppet named Julie and prompting sentences are used to encourage the child to name each picture, e.g., *Julie voit deux grands animaux, un joli _____* (*éléphant*) et un _____(*kangourou*) ('Julie sees two animals, a pretty _____ (éléphant) and a _____(kangourou)'). Prompting sentences are suggested for each targeted word; however, S-LPs may choose different prompting sentences depending on the child. When targeting words that begin with a vowel (e.g., *éléphant*), it is recommended to use a prompting phrase that ends with a vowel, e.g., *Julie voit un joli _____* (*éléphant*) rather than an article, as in *Julie voit un* ('*an*')_____ (*éléphant*). This strategy allows the clinician to explore whether the child's production shows a remnant of the article (as in [nele'fɑ̃]), that is, whether the pronunciation is influenced by the preceding consonant of the article with respect to the *loi de la liaison* ('liaison rules': Rose & Wauquier-Graveline, 2007), and/or whether the child only produces syllables that begin with consonants.

If the child does not recognize the object or picture, the clinician provides a choice of two responses, e.g. "does the image represent X or Y?" (where X represents the target word). If this strategy also does not work, the clinician says the target word and asks the child to repeat it. It is recommended to provide the prompting sentence before giving the choice of two words, as following other

researchers in clinical phonology (e.g., Preisser, Hodson, & Paden, 1988). Furthermore, if words other than those on the test appear necessary for the assessment of a certain child, these can be added.

Transcription and Analyses

Ideally, a native speaker of French will administer the test and complete the transcription using the International Phonetic Alphabet; however, non-French-speaking S-LPs can ask a caregiver or interpreter to help with elicitation, and can use the French audio-recordings as a model when completing the transcription (the recordings are also freely available from the authors). Free software programs are available for analysing the various levels of the phonological system, for example, two Canadian products: (1) PHON (Rose & MacWhinney, in press; Rose et al., 2006, childes.psy.cmu.edu/phon/) and (2) the Computerized Articulation and Phonology Evaluation System (CAPES, Masterson & Bernhardt, 2001, available from the authors). The assessment data can also be evaluated using a freely available nonlinear scan analysis (see Appendices 1 and 2 or contact the authors), which can lead to an intervention plan (goals, strategies) if warranted.

The T*est de phonologie du français* was created to evaluate the phonology of Manitoba French speakers; however, the test can be easily adapted to evaluate the speech of French-speaking children in all dialects of French across Canada. For example, if a child speaks a particular French dialect in New Brunswick, the S-LP can adjust the targeted words or speech sounds to reflect the regional dialect. The clinician will then compare the child's productions to the adult targets (adult targets for Montreal French will be soon available for the test).

A note on French phonotactics and implications for analysis

In this section, we discuss briefly phonotactic restrictions in French that may affect phonological analyses (see also Rose and Wauquier-Gravelines, 2007). In Manitoba French, like other dialects in Canada, the (non-)realization of the schwa is dependent on the *Règle des trois consonnes* (Delattre, 1966), a general phonotactic against the production of three adjacent consonants in the speech production through schwa deletion. The schwa vowel may or may not be realized in spoken forms. Depending on the speakers, this lax vowel may be produced anywhere along the continuum that exists between [œ] and [ə]. Therefore, where syllable deletions occur with target schwa vowels, the clinician

will need to pay attention to whether the deletion is phonotactically prohibited or allowed.

French also displays a series of segmental changes at the edge of words in connected speech. The first such alteration is that of liaison, triggered in contexts where a hiatus would be formed at the boundary between two words. Liaison consists of the appearance of a latent consonant between the two words (in certain contexts, such as between clitics and nouns or verbs), which gets realized as the onset of the second word. For example, the phrase *un éléphant* /œ̃elefɑ̃/ (an elephant) is realized as /œ̃nelefɑ̃/. During elicitation, a child may use an unexpected consonant at the beginning of a vowel-initial word; liaison needs to be considered before assuming a phonological mismatch pattern. During elicitation it is thus best to provide the entire sentence except the target word (as noted above).

Finally, another phonotactic phenomenon in French is that of enchaînement: the re-assignment of a word-final consonant as an onset of the following word. For example, in the phrase *un bel elephant* ('a beautiful elephant') /œ̃ bɛl elefɑ̃/, the word-final consonant of bel becomes the onset of *éléphant*, as in /œ̃ bɛ lelefɑ̃/. In contrast to liaison, enchaînement does not prompt the appearance of latent consonants; rather, it affects the syllabification of lexical word-final consonants that are systematically produced, no matter the syntactic or phonological context (Encrevé & Scheer, 2005). Again, during analysis, it will be important to observe the context of elicitation of vowel-initial words.

Psychometric Properties of the Test

The *Test de phonologie du français* is a flexible tool that can be easily adapted to examine a child's phonological development. For example, the clinician can choose to complete the entire test or to administer only a few sections. The clinician can also add any number of targeted words to examine more closely the child's speech. (A screening set from the list is also available.)

The test has not yet been standardized and there is no information on floor effects and ceiling effects. Reliability has been evaluated only qualitatively by S-LP report. Clinicians who regularly use the test have noted anecdotally that the tool is precise and the results are consistent across items. In terms of content validity, the targeted words correspond to the test objectives, specifically the analysis of Canadian (Manitoba) French phonology. During the test development, all the phonological characteristics of each word were taken

Table 7. A selection of 10 pronunciations for a child aged 4;1 with notably protracted phonological development.

Target word	Adult	Participant 1	# Syl	Initial C		V1		Medial SF		V2		Medial SI		V3		Medial SF		Medial SI		V4		Final C	
				A	Ch	A	Ch	A	Ch	A	Ch	A	Ch	A	Ch	A	Ch	A	Ch	A	Ch	A	Ch
Lait	lɛ	lɛ	1	l	l	ɛ	ɛ																
Plume	plʏm	plʏm	1	pl	pl	ʏ	ʏ															m	m
Cheveux	ʃ(v)(ə)vœ	səfe	1(2)	ʃ	s	ə	ə					v	f	œ	e								
Glissade	glisad	gʰiçal	2	gl	gʰ	i	i					s	ç	a	a	d	l						
Plonger	p(ʰ)lɔ̃ʒe	plɔçe	2	pl	pl	ɔ̃	ɔ					ʒ	ç	e	e								
Musique	myzɪk	gʏz>ik	2	m	g	y	ʏ					z	z>	ɪ	i	k	k						
Balançoire	balɑ̃swaʁ	pajɸwæ:	3	b	p	a	a					l	j	ɑ̃	-			sw	ɸw	ɑ	æ:	ʁ	-
Éléphant	ʔelefɑ̃	ʁiβæ	3	ʔ	-	e	-					l	ʁ	e	i			f	β	ɑ̃	æ		
Kangourou	kɑ̃guʁu	taɰu	3	k	t	ɑ̃	a					g	-	u	-			ʁ	ɰ	u	u		
Champignon	ʃɑ̃piŋɔ̃	zjɔ̃	3	ʃ	-	ɑ̃	-					p	-	i	-			ŋ	zj	ɔ̃	ɔ̃		

Note. C = consonant, V = vowel, Syl = syllable, SF = syllable-final, SI = Syllable-initial; Ch = Child; A = Adult.

Table 8. A selection of 10 pronunciations for a child aged 3;11 with typical phonological development.

Target word	Adult	Participant 2	# Syl	Initial		V1		Medial SF		V2		Medial SI		V3		Medial SF		Medial SI		V4		Final	
				A	Ch	A	Ch	A	Ch	A	Ch	A	Ch	A	Ch	A	Ch	A	Ch	A	Ch	A	Ch
Lait	lɛ	lɛ	1	l	l	ɛ	ɛ																
Plume	plʏm	plʏm	1	pl	pl	ʏ	ʏ															m	m
Cheveux	ʃ(v)(ə)vœ	ʃəvœ	1(2)	ʃ	ʃ	ə	ə					v	v	œ	œ								
Glissade	glisad	glisad	2	gl	gl	i	i					s	s	a	a							d	d
Plonger	p(ʰ)lɔ̃ʒe	pʰlɔ̃ʒe	2	pʰl	pʰl	ɔ̃	ɔ̃					ʒ	ʒ	e	e								
Musique	myzɪk	myzɪk	2	m	m	y	y					z	z	ɪ	ɪ							k	k
Balançoire	balɑ̃swaʁ	balɑ̃swaʁ	3	b	b	a	a					l	l	ɑ̃	ɑ̃			sw	sw	ɑ	a	ʁ	ʁ
Éléphant	ʔelefɑ̃	ʔelefɑ̃	3	ʔ	ʔ	e	e					l	l	e	e			f	f	ɑ̃	ɑ̃		
Kangourou	kɑ̃guʁu	kɑ̃guɾu	3	k	k	ɑ̃	ɑ̃					g	g	u	u			ʁ	ɾ	u	u		
Champignon	ʃɑ̃piŋɔ̃	ʃɑ̃piŋɔ̃	3	ʃ	ʃ	ɑ̃	ɑ̃					p	p	i	i			ŋ	ŋ	ɔ̃	ɔ̃		

Note. C = consonant, V = vowel, Syl = syllable, SF = syllable-final, SI = Syllable-initial; Ch = Child; A = Adult.

into account according to a nonlinear phonological framework (word length, stress pattern, syllable structure, segments and features by position, feature sequences). A whole word match analysis was conducted with a group of 10 preschool children speaking Manitoba French, suggesting that the tool was able to identify children with protracted versus typical phonological development (Bérubé, Bernhardt, Stemberger, & Bacsfalvi, 2012). (A whole word match indicates that every segment of a word matches the adult target. [Ingram, 2002; Schmitt, Howard, & Schmitt, 1983].)

For example, a whole word match score for one child aged 4;1 with notably protracted phonological development (Participant 1) was 27.5% and for a typically developing child aged 3;11, was 92.5% (Participant 2). A sample of their pronunciations is presented in Tables 7 and 8.

Participant 1 had a high proportion of deletions and substitutions for fricatives, rhotics, and clusters, especially in multisyllabic words and within unstressed syllables. Moreover, Participant 1 exhibited numerous mismatches with nasal vowels (especially denasalization) within unstressed syllables. These same nasal vowels were produced accurately in stressed syllables in words of the same length. By contrast, Participant 2 showed mastery of most segments, including nasal vowels in both stressed and unstressed syllables. Both children accurately produced labial and coronal stops in disyllabic and multisyllabic words in 90% of instances, which is expected for children aged 4 years (Morgenstern et al. 2010). Their data show that the elicitation tool is capable of discriminating between a child who has moderately to severely protracted phonological development and a child with typical phonological development. In the next phase, data will be collected and statistically analysed from more children, which will increase the reliability and predictive validity of the tool.

Conclusion

The current paper introduces a phonological assessment tool specifically created to evaluate Canadian French phonology (in particular the Manitoba French dialect). The tool can be easily adapted for other Canadian French dialects. The word list was created in accordance with a nonlinear phonological framework (Bernhardt & Stemberger, 1998) and represents the phonology of Manitoba French adults. The tool allows for a representative and efficient evaluation (20-30 minutes) of the complete phonological repertoire of French: each

phoneme is tested twice across a variety of word lengths, prominence patterns, and syllable structures. This clinical tool is now used across Canada by S-LPs working in a variety of contexts, including school boards, local community services, and private practice. The feedback from the S-LPs has been positive and they report that the children enjoy the assessment, especially with the use of a puppet. The French phonology test is part of a larger research program that is examining the multisyllabic word production of French-speaking children (Bérubé et al., 2014) and the interaction between word length and syllable structure across manner of articulation (Bérubé et al., 2010, 2011, 2012). The French phonology test, the set of pictures, the list of words, the audio files for Manitoba French, and the nonlinear analysis tool to help clinicians complete the evaluation and target therapy goals (see Appendix 1 and 2) are freely available from the authors. Similar tests are available for an additional 13 languages, including a recent adaptation for Standard French (Parisian French) (Bérubé, Bernhardt, Stemberger, & de Almeida, 2014), most of which are available at no cost from the authors. Moreover, an online tutorial on how to use the nonlinear analysis tool (for French and English) will be freely available in spring 2015 by contacting the authors. See Table 9 for the list of words used for the online tutorial.

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Table 9. A selection of 31 pronunciations for a child aged 4;1 with notably protracted phonological, used for the online tutorial

Target word		Child's production	A Syl	Target word shape	Child's word shape	Initial				Medial SI		V-M(1)		SI		V-M(2)		SF		SI		V-M(3)		SF		V-M(4)		Final	
Orthography	Phonetic					A	Ch	A	Ch	A	Ch	A	Ch	A	Ch	A	Ch	A	Ch	A	Ch	A	Ch	A	Ch	A	Ch	A	Ch
Lait	lε	lε	1	CV	CV	l	l	ε	ε																				
Plume	plʏm	plʏm	1	CCVC	CCVC	pl	pl	ʏ	ʏ																			m	m
Soif	swaf	ṣwæf	1	CCVC	CCVC	sw	ṣw	a	æ																			f	f
Tasse	tas	tɑṣ	1	CVC	CVC	t	t	ɑ	ɑ																			s	ṣ
Vache	vaʃ	væs	1	CVC	CVC	v	v	a	æ																			ʃ	s
Zoo	zo	zo	1	CV	CV	z	z	o	o																				
Cheveux	ʃ(v)(ə)'vœ	ɕə'vœj	1(2)	C(V)CV	CVCVC	ʃ(v)	ɕ	(ə)	ə					v	v	œ	œ												j
Cheveux	ʃ(v)(ə)'vœ	sə'fe	1(2)	C(V)CV	CVCV	ʃ(v)	s	(ə)	ə					v	f	œ	e												
Cheveux	ʃ(v)(ə)'vœ	ṣə'βœ	1(2)	C(V)CV	CVCV	ʃ(v)	ṣ	(ə)	ə					v	β	œ	œ												
Glissade	gli'sad	gʰi'ṣal	2	CCVCVC	CVCVC	gl	gʰ	i	i											s	ṣ	a	a					d	l
Glissade	gli'sad	gʰi'ṣaḍ	2	CCVCVC	CVCVC	gl	gʰ	i	i											s	ṣ	a	a					d	ḍ
Glissade	gli'sad	kli'ɕad	2	CCVCVC	CCVCVC	gl	kl	i	i											s	ɕ	a	a					d	d
Gorille	gɔ'ʀij	gɔ'ʁij	2	CVCVC	CVCVC	g	g	ɔ	ɔ											ʀ	ʁ	i	i					j	j
Musique	my'zɪk	gʏ'z>ik	2	CVCVC	CVCVC	m	g	y	ʏ											z	z>	ɪ	i					k	k

Word	Adult	Child	Syl	A	Ch																
Plonger	plɔ̆ʒe	plɔ̃'ɕe	2	CCVCV	CCVCV	pl	pl	ɔ̃	ɔ̃			ʒ	ɕ	e	e						
Robot	ʁo'bo	ʁə'bo	2	CVCV	CVCV	ʁ	ʁ	o	ə			b	b	o	o						
Saucisses	sɔ'sɪs	s>u's>iɕ	2	CVCVC	CVCVC	s	s>	ɔ	u			s	s>	ɪ	i					s	ɕ
Tomate	tɔ'mat	tʰɔ'matʰ	2	CVCVC	CVCVC	t	tʰ	ɔ	ɔ			m	m	a	a					t	tʰ
Balançoire	balɑ̆swaʁ	paj'ɸwæ:	3	CVCVCCVC	CVC.CCV	b	p	a	a			l	j	ã		sw	ɸw	ɑ	æ:	ʁ	
Dinosaure	d͡zino'zaʁ	tinoʁɔ'zɔx	3	CVCVCVC	CVCVCVCVC	d͡z	t	i	i	n	n	o	o	ʁ		ɔ		z	z	ɑ	ɔ	ʁ	x
Éléphant	(ʔ)ele'fã	ʁi:'βæ	3	VCVCV	CV:CV	(ʔ)		e				l	ʁ	e	i:			f	β	ã	æ
Éléphant	(ʔ)ele'fã	n'ifa	3	VCVCV	CVCV	(ʔ)		e				l	n	e	i			f	f	ã	a
Éléphant	(ʔ)ele'fã	li'fa	3	VCVCV	CVCV	(ʔ)		e				l	l	e	i			f	f	ã	a
Kangourou	kãgu'ʁu	kaw'ʁu	3	CVCVCV	CVC.CV	k	k	ã	a			g	w	u				ʁ	ʁ	u	u
Kangourou	kãgu'ʁu	ta'ɥu	3	CVCVCV	CVCV	k	t	ã	a			g		u				ʁ	ɥ	u	u
Kangourou	kãgu'ʁu	kʰa.ə'ʁu	3	CVCVCV	CV.V.CV	k	kʰ	ã	a			g		u	ə			ʁ	ʁ	u	u
Crocodile	kʁɔkɔ'd͡zɪl	ʁəː'ŋe	3	CCVCVCVC	CV:CV	kʁ	ʁ	ɔ	əː			k	ŋ	ɔ	e			dz		ɪ		l	
Perroquet	pɛʁɔ'kɛ	pe.ɔ.i'tɛ	3	CVCVCV	CV.V.CV	p	pl	ɛ	e			ʁ		ɔ	ɔ			k	t	ɛ	ɛ
Champignon	ʃãpi'ŋɔ̃	zjɔ̃	3	CVCVCV	CCV	ʃ	zj	ã				p		i				ŋ		ɔ̃	ɔ̃
Champignon	ʃãpi'ŋɔ̃	ʃã.pʰɪi.'ʃɔ̃	3	CVCVCV	CV.CVV.CV	ʃ	ʃ	ã	ã			p	pʰ	i	ɪ			ŋ	ʃ	ɔ̃	ɔ̃
Champignon	ʃãpi'ŋɔ̃	ʂãpi'ŋɔ̃	3	CVCVCV	CVCVCV	ʃ	ʂ	ã	ã			p	p	i	i			ŋ	ŋ	ɔ̃	ɔ̃

Note. C = consonant, V = vowel, Syl = syllable, SF = syllable-final, SI = Syllable-initial; Ch = Child; A = Adult, V-M = vowel in medial position.

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Acknowledgements

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Appendix 1
Analyse non-linéaire – canadien français 2014 ©

Auteurs: Bernhardt, B. M. H., Stemberger, J.P., Bérubé, D.

Adaptée selon: Bernhardt, B.H. et Stemberger, J.P. (2000).
Workbook in Nonlinear Phonology for Clinical Application.
Austin, TX: PRO-ED (copyright reverted to authors)

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Les pages 1 à 5 incluent l'analyse et l'élaboration des objectifs de la thérapie.
Pour les cas plus complexes, utilisez les pages 6 à 8.

Nom : _____   Date de naissance : _____

Date de l'évaluation : _____   Age : _____

Difficulté d'audition : _____

Dialecte : _____

Habiletés de la communication de l'enfant: habileté/difficulté : _____

_____

Référé par : _____

% des mots entièrement corrects: _____ Séquences de CV correctes: _____ PCC (C. simples): _____

Séquence des objectifs de la thérapie et des stratégies de thérapie

	Structure du mot	Position, séquence	Traits et segments
Objectifs principaux de thérapie (indiquez la séquence des objectifs)			Traits individuels : Combinaison de traits :
Stratégies pour la thérapie (selon les objectifs principaux)	1. Segments établis selon la structure du mot (objectifs de la position des segments) : 2. Stratégies de thérapie :		1. Structure des mots à utiliser (séquence CV) : 2. Stratégies de thérapie :

Survol rapide – Encerclez ou cochez la case correcte

Niveau	Forme	Acquis/Capacité		Plus d'analyses sont nécessaires	
Structure prosodique	Longueur du mot L'enfant produit des consonnes, mais le mode d'articulation, le point d'articulation ou le voisement ne correspond pas nécessairement à la cible adulte	Peu d'omission	☐	Page 3	☐
		Peu d'épenthèse	☐		
Voyelles		Non-nasales	☐	Page 7	☐
		Nasales	☐		
Consonnes Voir page 4	Mode d'articulation (la manière dans laquelle un son est produit)	Peu de substitutions du **mode d'articulation**	☐	Pages 4 et 6	☐
	Point d'articulation (l'endroit où un son est produit)	Peu de substitutions du **point d'articulation**	☐	Pages 4 et 6	☐
	Voisement (laryngé)	Peu de substitutions du **voisement**	☐	Pages 4 et 6	☐

		Acquis/capacité	Plus d'analyses sont nécessaires	
Variabilité et séquences	De façon globale, l'enfant démontre peu de variation dans la production des sons		Productions diverses pour un mot	☐
			Productions diverses pour le même son, la même structure de phrase	☐
			Plusieurs assimilations	☐
			Les consonnes et voyelles se déplacent à d'autres endroits dans le mot	☐
			Si oui, consulter la p. 5	

Analyse de la structure du mot : Survol seulement, pas besoin de compter les phonèmes

A. Inventaire ou analyse indépendante = productions de l'enfant **B. Analyse relative** = comparaison avec la production adulte

Codez (selon la couleur): ==Acquis/capacité==, besoins/non acquis, ==inconstant== PI = position initiale, PM = position médiane, PF = position finale

(Optionel: Longueur du mot _____ ; Séquences de CV_____ ; Cs. présentes par position _____ ; CC présentes _____ ; Autres: _____)

A. Inventaire : Nombre de syllabes par mot	Inventaire : Forme du mot dans les séquences CV (parenthèses = optionnel)	B. Analyse relative : Comparaison avec la production adulte Encerclez ou cochez		
1 syllabe ☐ ==Acquis/Capacité== ☐ Besoin/non acquis ☐ Forme du mot la plus complexe : Données manquantes	Structures fréquentes au niveau du mot dans les séquences CV : CV(V) CV(V)C Autres : _____ Consonne initiale simple Consonne finale Groupes consonantiques : PI PM 2 consonnes/mot	Omission de syllabe	2 syl ☐ 3+ syl ☐ Rare ☐ Souvent ☐	
		Addition d'une syllabe	Rare ☐ Souvent ☐	
		Déplacement accentuel	Rare ☐ Souvent ☐	
		Ajout de Consonne	Rare ☐ Souvent ☐	
		Omission de consonne simple PI PM PF	Rare ☐ Souvent ☐ Rare ☐ Souvent ☐ Rare ☐ Souvent ☐ Omission↑dans les mots plus longs ☐	
2 syllabes ☐ ==Acquis/Capacité== ☐ Besoin/non acquis ☐ Forme du mot la plus complexe : Données manquantes	Structures fréquentes au niveau du mot ayant des séquences CV : CVCV CVCVC CVCCVC Autres : _____ Consonne simple : PI PM PF Groupe consonantique : 1/mot 2/mot CC PI PM PF CCC Iambique Trochaïque	Omission d'au moins 1 C dans CC(C) PI PM PF	Rare ☐ Souvent ☐ Rare ☐ Souvent ☐ Rare ☐ Souvent ☐ Omission↑dans les mots plus longs ☐	

3 syllabes ou plus ☐

Acquis/Capacité ☐

Besoin/non acquis ☐

Forme du mot la plus complexe :

Données manquantes

Exemples de forme de mots (CV) allongée :

Patrons d'accentuation : wwS wwwS Autres

PI   PM   PF

Consonnes simples :
Consonnes doubles :
Consonnes CCC :

2 ou 3 CC dans un mot ☐
CC et C dans PI ☐

Surutilisation des segments   PI ☐ PM ☐ PF ☐
Segments :

Acquis/capacité : _____

Besoins : _____

Inscrivez les acquis et les besoins à la p.8

Inventaire des consonnes simples : codez <mark>acquis/capacité</mark>, besoin/non acquis ou <mark>inconstant</mark>

Notez : Il est posible que l'enfant produise une consonne simple lorsque la cible adulte est CC. Inscrivez les consonnes simples dans le tableau.

En français : p$^{(h)}$ b m t$^{(h)}$ d n k$^{(h)}$ g ŋ f v s z ʃ ʒ l w j ʁ ʀ/r ɥ

(Inscrivez les consonnes simples que l'enfant est capable de produire)

	Position initial	Position médiane	Position finale
<mark>Acquis : capacité forte</mark>			
<mark>Inconstant : habileté partielle</mark>			
Consonne est produite, mais ne correspond pas à la cible adulte Besoin/non acquis			
Complètement absent de l'inventaire de l'enfant Besoin/non acquis			
Consonnes qui n'existent pas dans la langue française			
Non demandées			
Substitutions fréquentes (segments souvent utilisés) (Consultez le bas de la p. 6)			
Sommaire de l'inventaire des traits (consultez la liste des traits à la p. 6)			

Consonnes qui manquent (pas produites) dans une position spécifique mais produites dans une autre position du mot
Veuillez indiquer les consonnes, habiletés et besoins trouvés sur cette page à la p. 8

Position initial	Position médiane	Position finale

Consonnes doublées – à ajouter à la p. 8

Codez : acquis/capacité, besoin/non acquis, inconstant

Indiquez toutes les consonnes doublées que l'enfant produit, surtout en position médiane. Indiquez l'inventaire complet des consonnes doublées et les patrons.

	Position initiale	Position médiane (à travers une frontière syllabique)	Position médiane (attaque)	Position finale
CC avec /j/, /w/ ou nasale	pj bj ʃj pw dw vw sw ʁw nɥ nw (ʃm)		tw mj	
CC avec /l/	pl bl kl gl fl			gl
CC avec /ʁ/ʁ/r/	pʁ bʁ tʁ dʁ kʁ gʁ fʁ		fʁ ʁk	ʁd ʁs bʁ
CC avec fricative autre que /s/	fl fʁ vw ʃj (ʃv)		tʁ fʁ	vʁ
CC avec /s/	sw		sw sj sk st	st ʁs stʁ
CCC			ʁʃj skɥ	ʁbʁ
À travers une frontière syllabique		k.t ʃ.k		
Autres :				

Dans le cas où l'enfant produit les patrons suivants, il est important d'examiner le résultat de ces derniers.
Écrivez des exemples de mots qui contiennent ces patrons.
Est-ce que ces patrons se trouvent surtout dans les mots multisyllabiques Oui ☐ Non ☐

Assimilation / lãp/ > [mãp]	Dissimilation /pu/>[pi] mais /ti/>[tu]	Métathèse /sp/ > [ps]	Épenthèse /plɣm/ > [pəlɣm]	Coalescence /sp/ > [f] [Lab,+cont] fusion	Omission majeure

Séquences adultes : Inscrivez les séquences C_C ou CC selon les besoins. Inscrivez les séquences correctement produites (cibles adultes) qui ont été identifiées dans les tableaux ci-dessus. Ajoutez des exemples de mots pour chacune des séquences de consonnes doublées
L=Labiale; C=Coronale; D=Dorsale; U=Uvulaire

Séquence adulte	Séquence adulte	Séquence adulte	Séquence adulte
L-L	C-C	D-D	
L-C	C-L	D-L	U-L
L-D	C-D	D-C	U-C
L-U	C-U	D-L	U-D

Pages additionnelles : Consonnes et traits: Patrons de substitution

Veuillez décrire les substitutions relatives aux traits (colonne de gauche). Les substitutions sont organisées selon le **mode d'articulation**, le **point d'articulation** et le **voisement**. Portez attention aux substitutions (et non aux omissions), sauf si les omissions sont limitées à un nombre restreint de traits (modes d'articulation, points d'articulation ou voisement). Ce tableau aide à déterminer les objectifs de thérapie relative aux traits individuels et aux traits combinés (par exemple, l'enfant produit le son /f/, mais ne produit aucune autre fricative).

Traits	Consonnes selon l'inventaire adulte	Position initiale	Position médiane	Position finale
Mode d'articulation Semi-voyelles : [-consonantique] ([+sonant])	j w ɥ			
Liquides : [+sonant et +consonantique]	l ʀ / ʁ (r)			
[+latéral]	l			
Nasales : [+nasale]	m n ŋ			
Plosives : [-continu] [-nasale])	p b t d k g ([ʔ])			
Fricatives : [+continu] ([-sonant])	f v s z ʃ ʒ			
Affriquées allophoniques : [ts]/[dz]	ts dz / _V [+haut, -arrière,+arrondi]			

Point d'articulation Labiale	p b m f v w ɥ		
Labiodentale	f v		
Coronale [+antérieur]	t d n s z ts dz l (r)		
[-antérieur]	ʃ ʒ j ɥ		
«[+grooved]» ou [+strident]	ts s z dz ʃ ʒ		
Dorsale [+haut]	k g ŋ j w ɥ		
Dorsale [-haut] [-bas]	ʀ ʁ		
Voisement [-voisée]	p t k f s ts ʃ		
[+voisée] plosives et fricatives	b d g v z dz ʒ ʁ		
[+glotte étendue]	f s ts ʃ		

Pages additionnelles : Voyelles (seulement s'il y en a un besoin)
A. Inventaire ou analyse indépendante = productions de l'enfant
B. Analyse relative = comparaison avec la production adulte
Codez acquis/capacité, besoin/non acquis, inconstant

A. Inventaire des voyelles	Besoin spécifique	
	Syllabe accentuée	Syllabe non accentuée
Voyelles orales : i ɪ e ɛ a y ʏ ø œ œ ə ʌ ɔ u o ɒ Voyelles nasals : ɛ̃ œ̃ ɑ̃ ɔ̃ Autres:		

Codez besoins/non acquis ou inconstant (identifiez les changements de traits).

B. Analyse relative Traits	Voyelles	Différence comparée à la production adulte	
		Syllabe accentuée	Syllabe non accentuée
Dorsale [+arrière]	ʌ ə ɔ u o ɒ ɑ̃ ɔ̃		
Coronale [+avant]	i ɪ e ɛ a y ʏ ø œ œ ɛ̃ œ̃		
Dorsale [+haut]	i ɪ y ʏ u		
Dorsale [-haut] et [-bas]	e ɛ ø œ o ɔ ɛ̃ œ̃ ɔ̃		
Dorsale [+bas]	a œ ɒ ɑ̃		
Labiale [+arrondi]	y ʏ ø œ œ u o ɔ œ̃ ɔ̃		
[+tendu]	i e a y ø u o ɑ ɑ̃ ɛ̃ œ̃ ɔ̃		
[-tendu]	ɪ ɛ ʏ œ œ ə		

À noter :
a) Séquences qui contiennent /w/ et /ɥ/ sont inclues dans la section de groupes consonantiques
b) Veuillez indiquer les observations de la prosodie, l'intonation, le rythme et du débit de la parole

Veuillez indiquer les habiletés et les besoins de l'enfant selon les voyelles à la p. 8.

Pages additionnelles : Objectifs et stratégies pour la thérapie

	Structure du mot	Position du mot et séquences (de la p. 4 et 5)	Traits et segments (de la p. 4 et 6)
Acquis/Capacité qui peuvent être utilisés comme stratégies dans l'intervention	Nombre de syllabes par mot :	Consonnes simples par position du mot (voir **acquis** de la p. 4)	Consonnes par types ou traits individuels (des p. 4 et 6)
		Position initiale :	Mode d'articulation :
		Position médiane :	Point d'articulation :
	Forme de mot CV :	Position finale :	Voisement :
		Séquences consonnes doubles (voir la p. 5)	Voyelles :
		C_C :	
	Patrons d'accentuation :	CC :	
		V_V :	
Besoins/non acquis	Nombre de syllabes par mot :	Consonnes simples par position du mot (voir la p. 4)	Consonnes par types ou traits individuels (des p. 4 et 6)
		Position initiale :	Mode d'articulation :
		Position médiane :	Points d'articulation :
	Forme du mot CV :	Position finale :	Voisement :
		Séquences consonnes doubles (voir la p. 5)	Voyelles :
		C_C :	**C : Combinaison de traits**
	Patrons d'accentuation :	CC :	Mode - point d'articulation
		V_V :	Mode - voisement
			Point d'articulation – voisement
			Traits et combinaisons de voyelles

Autres facteurs à considérer (selon la p. 2) :

Appendix 2
Nonlinear Phonological Scan Analysis for Intervention Planning - French

© Bernhardt, B. May, Stemberger, Joseph P, & Bérubé, D.

Adapted from © "Workbook in Nonlinear Phonology for Clinical Application"

Pages 1–5 provide a basic analysis for word structure and consonants.
Additional Pages: p. 6-consonant feature mismatch patterns; p. 7-vowels; p. 8-Summary

Name: _____ Birthdate: _____

Test date: _____ Age: _____ Hearing : _____

Contact information: _____

General communication: _____

Referrals needed: _____

Optional % Match: Whole Word: _____ Word Shape (CV): _____ Consonants (PCC): _____

Other counts: _____

Long-term goals: (see p. 8): _____

First Block Treatment Goals: Type, Order, Treatment Strategies

	Word Structure	Positional, sequences	Features, Segments: p. 4 (6,7)
Goals for first treatment block with numbered order	Length (See p. 3) Stress Word shapes:	Positional: p. 4, bottom Sequences: p. 5	Individual features: Existing features to combine into new segment(s):
Therapy strategies by goal #	Strong segments to use: See p. 4, top Tx Strategies:		Strong word shapes to use: p.3 Tx Strategies:

Overview – Circle or check boxes. 5-10 minute quick look.

This page helps identify (a) which analyses are needed and
(b) client strengths that may be useful for treatment.

Level	Forms	Clear Strength	Needs analysis
Word structure *For structure, the consonants and vowels do not have to match the actual adult speech sounds, but need to be present in some form (substitutions acceptable).*		Minimal deletion ☐	☐ Page 3
		Minimal epenthesis ☐	
Vowels		Vowels ☐	☐ - Page 7
Consonants **See chart on p. 4**	Manner: How a speech sound is made	Few manner substitutions ☐	☐ - Page 4
	Place: Where a speech sound is made	Few place substitutions ☐	☐ - Page 4
	Laryngeal : (voicing)	Few voicing changes ☐	☐ - Page 4

	Clear Strength	Needs analysis (inconsistent or absent)
Variability and sequences	Overall, the client's productions are not variable. ☐	Different productions for the same word? ☐ Different productions for the same speech sound, word structure? ☐ Several assimilations ☐ Cs, Vs often move to other places in the word? ☐ **For analysis, go to Page 5**

Other Information about the Client

	Strength	Need	Unknown
Language production			
Language comprehension			
Preliteracy/literacy/phonological awareness			
Motor skills (gross, fine, oral mechanism)			
Social skills			
Cognitive skills			
Environmental support for treatment, referrals			

Word Structure: Length, Stress, Word Shape in CV Sequences (Counts optional)

A. The forms used by the client **B.** Comparison with adult targets

Colour: ==strength,== absent or marginal, ==inconsistent.== Present but not for adult target.

WI = word-initial, WM = word-medial, WF = word-final

A. Forms used <u>frequently</u> by client (parentheses = some use)	A. Summary by word length
1-syllable words used? ☐ **CV Sequences:** CV(V) CV(V)C **Other** _____ **Single C** WI WF **CC:** WI WF 2 CC/word? **CCC** WI WF	==Strength?== ☐ Need? ☐ Most complex CV shapes: Not elicited?
2-syllable words used? ☐ **CV sequences:** CV(V)CV CV(V)CVC CVCCV(C) **Other** _____ **Stress** (S=Primary, s=secondary, w=unstressed): **Sw wS Ss sS** **Single Cs:** WI WM WF **CC** WI WM WF 2 CCs/ word? CCs & WF C in word? **CCC** WI WM WF	==Strength?== ☐ Need? ☐ wS or sS stress? Most complex CV shapes: Not elicited?
3 or more syl. used? ☐ **Examples of long word shapes (CV):** **Stress:** Sws Ssw Sww swS wSw wwS Swsw swSw **Single Cs:** WI WM WF **CC** WI WM WF **CCC** WI WM WF 2-3 CCs in a word? CCs & WF C in word?	==Strength?== ☐ Need? ☐ wSw stress? Most complex CV shapes? Not elicited?

B. Comparison with Adult Target   *Circle or check*

Pattern: Length, stress	1 syllable	2 syllables	Multisyllabic
Syllable deletion		Yes Often? Where?	Yes Often? Where?
Syllable addition (vowel epenthesis)	Yes Often? Where?	Yes Often? Where?	Yes Often? Where?
Stress shift		Yes Often? Type:	Yes Often? Type:
Content reduced, weak syllables?		Yes Often? Type:	Yes Often? Type:

Pattern: CV Shape	WI	WM	WF	More in long words
Cs added	Yes Often?	Yes Often?	Yes Often?	Yes Often?
Deletion, Single Cs	Yes Often?	Yes Often?	Yes Often?	Yes Often?
Deletion in CC(C)	Yes Often?	Yes Often?	Yes Often?	Yes Often?
Overused Cs or Vs?	Yes Often?	Yes Often?	Yes Often?	Yes Often?

Optional Counts: % Word Length Match _____% Word Shape Match ___% C Present by Position _____
%CC Match _____ Other _____

Strengths: _____   Needs: _____ (Enter p. 8)

Client's Singleton Consonants
Note – Client may produce single Cs for adult CCs. These should be entered here.
Colour Codes: ==Match,== **absent or very marginal,** ==inconsistent,== **present but not for adult target**

French: pᵗʰ⁾ b m tᵗʰ⁾ d n kᵗʰ⁾ g ŋ f v s z ʃ ʒ l w j ʁ ʀ/r ɥ

Counts optional by phoneme	Word-initial	Word-medial intervocalic	Word-final
==Mostly match: Strength==			
==Inconsistent: Partial strength==			
Present but not for adult target (can include segments also used as matches Need?			
Tested but absent or very marginal			
Non-French speech sounds			
Not elicited/tested			
Frequent substitutions (potential default segments) (p. 6, bottom)			
Optional summary of inventory by features (Refer to features, p. 6)			

Consonants missing in one <u>established</u> word position but <u>found elsewhere in</u> word ==plus those inconsistent in a word position== (**Word Position Needs**, middle column pp. 1, 8)

Word-Initial	Word-Medial (intervocalic)	Word-Final

Neighbouring Consonant Sequences ("Clusters"): (Enter P. 8)
Colour: <mark>Strength,</mark> absent or very marginal, <mark>inconsistent,</mark> present but nor for adult target
Add additional CCs, especially word medially, and any WI clusters not tested.
Indicate what client used, and patterns of difference, e.g., /sp/ > [p]

	Word initial	Word medial (across syllable boundary)	Word medial (onset)	Word final
CC with /j/, /w/ or nasal	pj bj ʃj pw dw vw sw ʁw nɥ nw (ʃm)		tw mj	
CC with /l/	pl bl kl gl fl			gl
CC with /ʁ/ʁ/r	pʁ bʁ tʁ dʁ kʁ gʁ fʁ		fʁ ʁk	ʁd ʁs bʁ
CC with fricative other than /s/	fl fʁ vw ʃj (ʃv)		tʁ fʁ	vʁ
CC with /s/	sw		sw sj sk st	st ʁs stʁ
CCC			ʁʃj skɥ	ʁbʁ
Across syllable boundary		k.t ʃ.k		
Other :				

Mismatch Patterns in neighbouring or distant (C_C, V_V) sequences
Note examples of words with these patterns. Underline relevant parts of word.

Assimilation* /lɑ̃p/ > [mɑ̃p]	Dissimilation* /pu/>[pi] mais /ti/>[tu]	Metathesis* /sp/ > [ps]	Epenthesis* /plʏm/ > [pəlʏm]	Coalescence* /sp/ > [f] [Lab,+cont] fusion	Major deletion

*Occurs most in: Multisyllabic words ☐   Stressed syl. ☐   Unstressed syl.? ☐

Adult Target Sequences: (Enter C_C or CC, depending on needs)
Identify adult target sequences for mismatches above.
Can add match examples where <mark>inconsistent.</mark> L=Labial; C=Coronal; D=Dorsal (velar); U=Uvular

Adult sequence	Adult sequence	Adult sequence	Adult sequence
L-L	C-C	D-D	
L-C	C-L	D-L	U-L
L-D	C-D	D-C	U-C
L-U	C-U	D-L	U-D

Additional Page: Singleton Substitutions: Consonants, Features

This substitution analysis helps determine both individual and combination feature needs. Feature combination goals reflect inconsistency within a category, e.g., /f/ but no other fricatives. **Describe the substitutions that concern the feature at the left of the row, e.g. mismatch of manner only in the manner rows, mismatch of both place and manner in both rows.** Focus **on substitutions**, not deletions, unless deletions affect only occasional features.

Adult features	Adult C	Initial	Medial Intervocalic	Final
Manner Glides : [-cons] ([+son])	j w ɥ			
Liquids : [+son and +cons]	l ʀ /ʁ (r)			
[+lateral]	l			
Nasals : [+nasal]	m n ŋ			
Stops : [-continuant] & ([-nasal])	p b t d k g ([ʔ])			
Fricatives : [+cont] (&[-sonorant])	f v s z ʃ ʒ ʁ			
Affricates allophonic : [ts]/[dz]	ts dz / _V [+high, -back,+round]			
Place Labial	p b m f v w ɥ			
Labiodental	f v			
Coronal [+anterior]	t d n s z ts dz l (r)			
[-anterior]	ʃ ʒ j ɥ			
«[+grooved]» or [+strident]	ts s z dz ʃ ʒ			
Dorsal [+high]	k g ŋ j w ɥ			
Dorsal [-high] [-back]	ʀ ʁ			
Laryngeal [-voiced]	p t k f s ts ʃ			
[+voiced] stops and fricatives	b d g v z dz ʒ ʁ			
[+spread glottis]	f s ts ʃ			

Defaults: Frequent features, often in substitution patterns; may vary by word position.

Manner defaults? Circle expected: [+cons], [-cont], [-nas], [-lateral] Other:

Place defaults? Circle expected: Cor [+anterior] Other: _____

Laryngeal default? Circle expected: [-voiced] Other: _____

Additional Page: Vowels

A. The forms used by the client   **B.** Comparison with adult forms

Colour code as: **Strength,** **absent**, **inconsistent,** **present but not for adult target**

A. Vowels Used	Specific V Needs?	
	Stressed	Unstressed
Oral vowels : i ɪ e ɛ a y ʏ ø œ œ ə ʌ ɔ u o ɑ		
Nasal vowels : ɛ̃ œ̃ ɑ̃ ɔ̃		
Autres:		

Features	Vowels	Mismatch patterns by feature	
		Stressed	Unstressed
Dorsal [+back]	ʌ ə ɔ u o ɑ ɑ̃ ɔ̃		
Coronal [+front]	i ɪ e ɛ a y ʏ ø œ œ ɛ̃ œ̃		
Dorsal [+high]	i ɪ y ʏ u		
Dorsal [-high] & [-low]	e ɛ ø œ o ɔ ɛ̃ œ̃ ɔ̃		
Dorsal [+low]	a œ ɑ ɑ̃		
Labial [+round]	y ʏ ø œ œ u o ɔ œ̃ ɔ̃		
[+tense]	i e a y ø u o ɑ ɑ̃ ɛ̃ œ̃ ɔ̃		
[-tense]	ɪ ɛ ʏ œ œ ə		

Notes :
a) Sequences that contain /w/ **et** /ɥ/ **are included in consonant sequences page**
b) Include prosody, intonation, rhythm, speech rate, voice, resonance factors

Enter major vowel strengths and needs on Page 8.

Additional Page: Strengths and Needs/Goals (Immediate Goals P. 1)

Strength or Need?	Word Structure	Word Positions Sequences (from p. 4 and 5)	Features and segments (from p. 4 and 6)
Clear strength to use a treatment strategies	Syllables per word :	Single Cs by word position (matches p. 4) WI: WM: WF: Sequences (from p. 5) C_C: CC: V_V:	Cs by type or feature (from p. 4 and 6) Manner: Place: Laryngeal: Vowels:
	CV word shapes :		
	Stress patterns		
All needs / Potential Goals	Syllables per word :	Singles Cs : Word position needs (from p. 4) WI: WM: WF: Sequences (from p. 5) C_C: CC: V_V:	Cs : Individual features (from p. 4 and 6) Manner: Place: Laryngeal: Vowels: **Cs : Feature combinations within one segment** Manner - Place Manner - Laryngeal Place - Laryngeal Vowel features or combos :
	CV word shapes :		
	Stress patterns :		

Other factors to consider (from p. 2) :