

**ACOUSTIC ANALYSIS OF THE  
VARIETY OF FRENCH  
SPOKEN IN NEWFOUNDLAND**

by

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## **ABSTRACT**

This study presents the results of an acoustic analysis of the seven vowels considered most characteristic of the French from Newfoundland. The study is centred on a corpus of semi-spontaneous interviews with male speakers representing the francophone community on the Port-au-Port peninsula in Newfoundland.

The results garnered empirically document and characterise the variety. Specifically, they indicate that NF high vowels /i/ and /y/, but not /u/, have open variants [ɪ] and [ʏ], that mid unrounded vowels follow the orthoepic norm, and that the low vowels maintain their phonological opposition. The presence of diphthongs has also been noted. The data also show shared traits with varieties of French from France, Quebec, and Acadia.

The characterisation is then rounded-out with a discussion of its living potential within Fishman's RLS framework.

**Keywords:** phonetics; French; Newfoundland; segmental analysis; acoustic analysis; Reversing Language Shift

**Subject Terms:** Newfoundland French; French language – Phonetics

## RÉSUMÉ

Cette étude présente une analyse acoustique des particularités du système vocalique du français terre-neuvien. L'étude s'articule autour d'extraits de parole spontanée de locuteurs masculins de la communauté francophone de la péninsule de Port-au-Port à Terre-Neuve.

Les résultats de cette étude indiquent que des caractéristiques du système vocalique du français terre-neuvien sont partagés avec les trois autres variétés en comparaison. Les résultats révèlent que les voyelles hautes /i/ et /y/, mais non pas /u/, possèdent des variantes contextuelles [i] et [y], que les voyelles d'aperture moyenne suivent la *norme orthoépique*, et que les voyelles ouvertes maintiennent leur opposition phonologique. L'analyse a également souligné la présence de voyelles diphtonguées.

La théorie de Joshua Fishman est ensuite utilisée pour caractériser et commenter la vitalité de cette variété.

For my parents and my sister:

“ça vient du t'choeur”.

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# 1 INTRODUCTION

## 1.1 Background

The French from Newfoundland (henceforth NF) is the result of a unique ethnolinguistic evolution. It has been described as an oral language derived from the French from France, the Channel Islands, St. Pierre and Miquelon, and Acadia (Brasseur, 1994, 2001, 2007; King, 1978, 1983; King & Butler, 2005; Magord, 1995a, 1995b, 1996, 1998, 2001; Thomas, 1977). This variety evolved at first in relative isolation on the Port-au-Port peninsula and as a result seems to be free of constraints imposed by an international or educated “standard”. It has often been described as unique and rich in its phonetics, lexicology and morphosyntax (King, 1983; Magord, 1995a; Thomas, 1977).

Yet few researchers have systematically studied the phonological system and phonetic characteristics of the variety. Existing descriptions are impressionistic, limited and sometimes contradictory. Instead, studies have focussed on the lexical composition of the variety (Barter, 1986; Brasseur, 2001; 2007), including a study of the anglicisms produced by the speakers on the peninsula (Sellers, 1976). Researchers have also studied morphosyntactic particularities of NF, as it has been described as “typically Acadian” (Barter, 1986; King 1978, 1983, 1994; King & Butler, 2005; King & Nadasdi 1987, 1995). Therefore, the need remains for an objective acoustic quantification of the variety of French spoken in Newfoundland.

## **1.2 Statement of the Problem**

Previous studies of the phonetic particularities of Newfoundland French have predominantly made use of impressionistic perceptual information on the part of the researcher (Barter, 1986; Brasseur, 1994, 2001, 2007; King, 1978, 1983; Thomas, 1977). While these studies are important to the description of the variety, they do not rely on experimental quantification and, as a result, they are unable to provide objective points of reference for later studies. An objective and a detailed acoustic account of the vowel system of Newfoundland French could provide a more comprehensive understanding of the variety and confirm impressionistic observations made by Thomas (1977), King (1978, 1983) and Brasseur (2001). Subsequently, this analysis could also provide points of comparison to other varieties of French, including the Acadian variety to which Newfoundland French is often compared.

## **1.3 Purpose of the Present Study and Research Questions**

This research presents an acoustic study of the French from Newfoundland using seven of the vowels in the NF system. The primary purpose of the present study is to characterise the variety in order to accomplish the secondary goal of comparing NF to other varieties of French (Acadian, Quebec and Hexagonal), which will assist in determining if NF is indeed a variety of Acadian French as it is so habitually described.

In the present study, recordings of the semi-spontaneous speech of three male native speakers from the Port-au-Port peninsula of NF were analysed acoustically. Specifically, vowels were isolated from stressed position,

unstressed position, open syllable and closed syllable of over four hundred and fifty words. These parameters were chosen because of their alleged importance in previous research for determining the character and the vowel quality in other varieties of French (Barter, 1986; Brasseur, 1994, 2001, 2007; Carton, 1974; Delattre, 1948, 1966, 1981; Di Cristo, 1998, Dumas, 1987; Durand & Lyche, 2002; Gendron, 1966; Juneau, 1972; King, 1978; Le Clézio, 1989; Léon & Léon, 1997; Lucci, 1969, 1972; Martin, 1998, 2002; Massignon, 1962; Motopanyane, 1997; Rochet, 1995; Thomas, 1977; Tubach, 1989; Walker, 1984). The vowels under study are those considered characteristic of NF and are the most described in the scientific literature.

#### **1.4 Organisation of the Present Study**

Prior to an appraisal and a discussion of the results in Chapters 4 and 5, Chapter 2 will provide a review of the literature, which presents an overview of the political, social, and linguistic history of Newfoundland, as well as an in-depth look at the phonetic particularities of the variety. The chapter concludes with a look at the questions motivating this research.

Chapter 3 presents the methodology used in the development and undertaking of the acoustic analysis conducted in the scope of the present research, such as the selection of the corpus, the environments in which the vowels were found, and the measurement of vowel formant frequencies.

Chapter 4 reports on the results of the acoustic analysis undertaken. The chapter is divided into three major sections, reporting on the high, the mid unrounded, and the open vowels with regards to stress and to syllable structure.



Chapter 5 provides a discussion of the results, in an attempt to answer the two questions that provoked the current research: How is NF characterised by its vowels, and how does it compare to other varieties of French? On the basis of these results, the living potential of this variety will be briefly discussed. The chapter concludes with suggestions for future research.

## **1.5 Significance of the Study**

The present study provides a systematic and objective acoustic analysis of seven vowels from the NF system. It attempts to address the need for empirical data on the variety of French spoken in Newfoundland, in order to better characterise the variety and to situate it with reference to other varieties of French. In particular, the current study examined the first two formants of seven vowels (*/i/, /y/, /u/, /e/, /ɛ/, /ɑ/ and /a/*) in stressed, unstressed, open, and closed syllables from a corpus of semi-spontaneous speech.

The results of this study provide a quantification of this rarely described dialect of French in addition to points of comparison with other varieties of French. One of the aims of the current study is to provide empirical data to accurately describe this variety and shed light on contradictory claims regarding the nature of its vocalic system. Furthermore, an analysis using Fishman's framework (1990) provides a current sociolinguistic outlook on the living potential of the NF variety and a reflection on its future in the community.

## 2 LITERATURE REVIEW

### 2.1 Introduction

For much of its history, the island of Newfoundland was a pawn in the colonial battle between England and France, changing hands as many as three times over the course of a hundred years. This political and social history was nevertheless instrumental in the colonisation of Newfoundland and was a factor in the development and colouring of the island linguistic environment, in particular that of the Francophones of Newfoundland found on the Port-au-Port peninsula. The ethnolinguistic status of the Francophone population has been a topic of ongoing discussion (Magord, 1993, 1995a, 1995b, 1996, 1998, 2001; Magord *et al.*, 2002). However, with respect to the region's linguistic situation, some scientific texts have focused on lexical composition (Barter, 1986; Brasseur, 2001; 2007; Sellers, 1976), while others have focussed on the morphosyntactic particularities of the variety of French spoken in Newfoundland (Barter, 1986; Brasseur, 2001; King 1978, 1983, 1994; King & Butler, 2005; King & Nadasdi, 1987, 1995; Niederehe, 1991; Thomas, 1977). Nonetheless, the literature on the phonetic details of the variety is of particular interest. Although thus far impressionistic, the description of the variety can be clarified by acoustic analysis.

The characterisation of a language is a useful tool in the systematic and coherent distinction of language varieties. This can be done through the study of

the lexicology, the syntax, the morphology, the phonology, the phonetics, and the linguistic status. The variety of French spoken on the Port-au-Port peninsula (NF) has been labelled a variety of Acadian French (henceforth AF) as a result of morphosyntactic studies (King 1978, 1983, 1994; King & Butler, 2005; King & Nadasdi, 1987, 1995; Niederehe, 1991) and through impressionistic studies of the phonetic system (Brasseur, 2001; Thomas, 1977). Although valuable contributions to the characterisation of the variety, these studies neglect a broader and more objective characterisation of the variety and its status in the speech community.

## **2.2 Formation of the Language Variety**

The following section will give a brief introduction to the history and the political climate under which the francophone community in Newfoundland was formed. It will also 1) show how the isolation of the community was a key factor in the linguistic development of the variety, 2) demonstrate the subsequent linguistic pressures on the NF population, and 3) determine the current linguistic and sociolinguistic statuses of the variety.

### **2.2.1 The Population and Development of the NF Community**

The linguistic situation in Newfoundland between the XV<sup>th</sup> and XVIII<sup>th</sup> centuries was convoluted and is relatively undocumented. In Newfoundland, few records were kept during the early periods, and those that do exist either are mainly for population centres or are from European sources (cf. Statistics Canada, 1876; Prowse, 1895). For this reason, the characterisation of the variety

is even more important nowadays. A brief overview of the political and linguistic history of the island and the Francophone population will enable the identification of population and linguistic trends relevant to the development, the character, and the linguistic status of NF.

### **2.2.1.1 Origins of the NF Community**

Most researchers suggest that the first permanent Francophone colonisation initiative dates from 1713 with the Treaty of Utrecht (Magord, 1995a; Niederehe, 1991; Stoker, 1964; Thomas, 1977). The first Francophone settlers were colonisers from France (Brittany and Normandy), the Channel Islands and later, from Acadia (King, 1989; Magord, 1995a; Niederehe, 1991; Stoker, 1964; Thomas, 1977).

The Newfoundland fishery was instrumental in the colonisation and the population of the island by the French. The fishery brought the French<sup>1</sup> to Newfoundland for seasonal work, but many of them chose to remain year round, thereby establishing a more permanent French presence in the area.

Dozens of villages were founded on the West Coast, three of which are still active in the Francophone community today (Cape Saint-Georges, La Grand'Terre and L'Anse-aux-Canards). There, Francophones found freedom from the laws and taxes of the State. Some married into Highland Scottish and Irish families, thereby assimilating into the Anglophone population, while others chose to remain relatively isolated on the far western shores of the peninsula

---

<sup>1</sup> These fishermen were from Brittany (St. Malo, St. Brieuc, La Roche) and Normandy (Rouen, Granville).

(Thomas, 1977, 1983). None of the French fishermen working in Newfoundland returned to France after 1904, when France categorically abandoned its historic fishing rights in Newfoundland. They remained instead to become independent fishermen and landowners (Magord 1993, 1996; Rowe, 1980).

This West Coast population would also welcome other Francophones in search of independence and freedom, the Acadians (Section 2.2.1.2) and *les Vieux Français* (Section 2.2.1.3). The isolation of the population along with the linguistic input from new immigrants would prove influential to the development of the variety of French spoken on the Port-au-Port peninsula on the West Coast.

#### **2.2.1.2 The West Coast Community: The Acadian Population**

The population of the West Coast embraced new arrivals in 1755 when *Le Grand dérangement* saw the flight of Acadians, entire families, unmarried women, and Micmac<sup>2</sup>, towards the Port-au-Port peninsula (Figure 1). The Acadians and the French in Newfoundland had always been on good terms, due to an active and clandestine commerce that also included St. Pierre and Miquelon.

Until 1860, there continued to be a micro-current of Acadian immigrants to the peninsula from the regions of Margaree and Chéticamp (Magord, 1995b; Thomas, 1983). These Acadian immigrants would become an integral part of the French population of Newfoundland. They may have strengthened the population

---

<sup>2</sup> This is the most widely used spelling, whereas *Mi'kmaq* is the official spelling according to official Mi'kmaq websites: [www.fni.nf.ca](http://www.fni.nf.ca); [www.jasenbenwah.ca/mikmaq.htm](http://www.jasenbenwah.ca/mikmaq.htm); [www.kiptunation.ca](http://www.kiptunation.ca). It is the official spelling that will be used henceforth in this text.

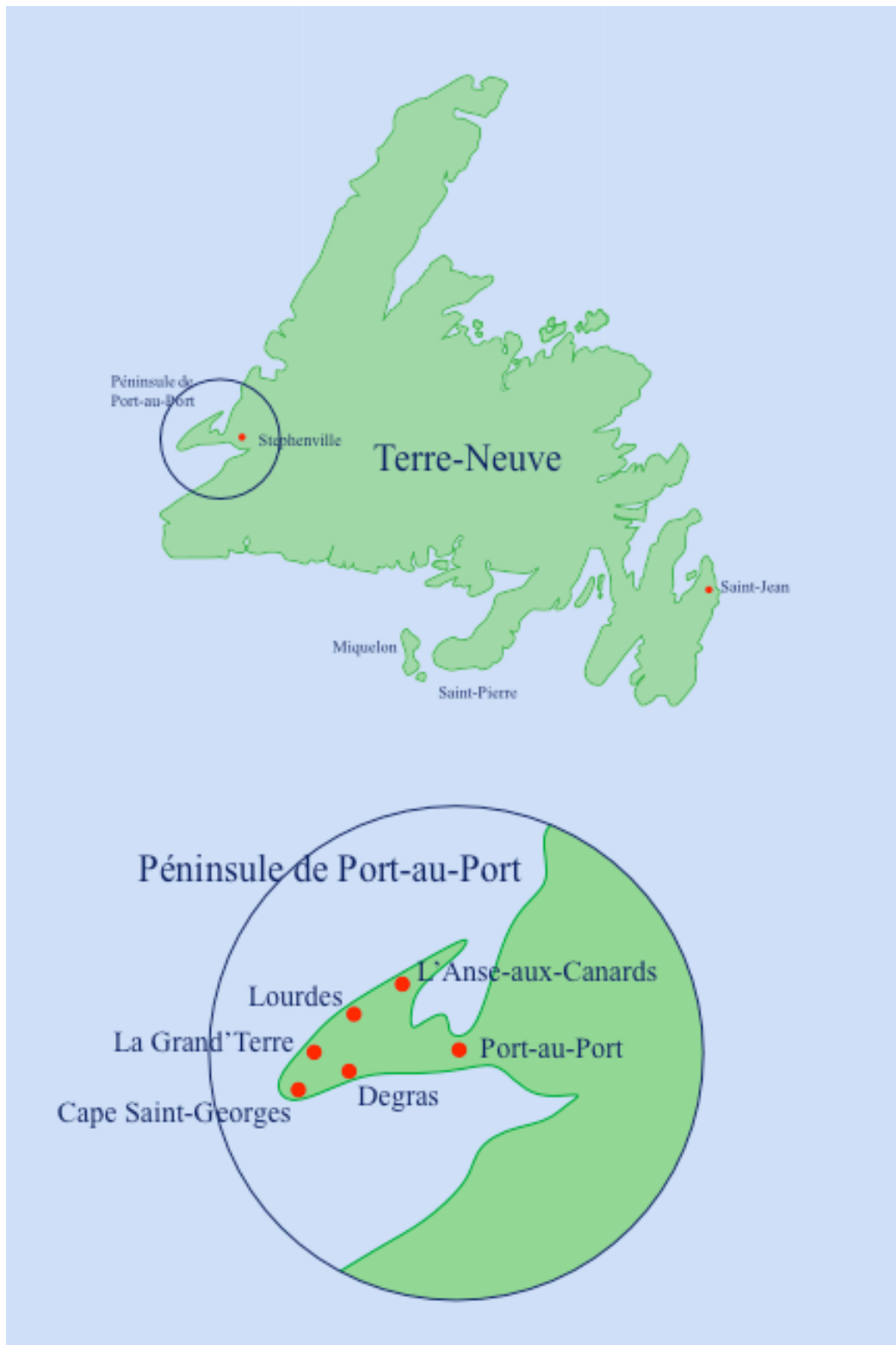
in number and variety and some became prosperous farmers (as mentioned by Thomas, 1977; 1983).

The linguistic contribution of these Acadian immigrants to the Newfoundland population is also of great import. Acadian women spoke AF at home, thereby ensuring its passage to the next generation (cf. Thomas, 1977). The lexical composition of the NF variety also contains several examples of Acadian and Mi'kmaq words (Table 1). King (1978, 1983), King and Butler (2005), and Thomas (1977) also remark that AF and NF share many morpho-syntactic properties, such as verb conjugation by analogical formation (the regularising of the *je* form of *avoir* to *j'as*, a pattern repeated in the imperfect tense of all verbs [*j'avas, t'avas, il ava*]), and the use of subject clitics unmarked for number (*je ...-ons*, as in *Je faisons ça souvent* "We do that often") (King & Butler, 2005).

**Table 1: Borrowed Words from Mi'kmaq in NF**

<i>Borrowed Word</i>	<i>Transcription</i>	<i>Lexical Meaning</i>
<i>macauque</i>	[makok]	cranberry
<i>misquish</i>	[mɪskwɪʃ]	sheep-tic
<i>moyaque</i>	[mɔjak]	common eider duck
<i>machecoui</i>	[maʃkwɪ]	birch bark

Figure 1: The Francophone Populations on the Port-au-Port Peninsula of Newfoundland



Thomas (1983) notes that these new arrivals were less likely to assimilate into English-speaking families through marriage, since they often arrived as a family. However, those who settled towards the east of the peninsula were more susceptible to the influence of English. Over time, the family name would become anglicised as the family became assimilated: Leblanc became White, Benoit became Bennet, Auquin became O'Quinn<sup>3</sup>, etc., (Thomas, 1983, p. 27).

By 1830, the population of St. George's on the Port-au-Port peninsula (cf. Figure 1) numbered about 2000 inhabitants, of whom 1200 were Acadian or Francophone. In addition, 400 inhabitants were English and 400 were "Native"<sup>4</sup> (Charles de la Morandière, cited by Thomas, 1983, p. 29-30). Statistics suggest the total population of Newfoundland was estimated at around 59,000 at this time (Statistics Canada, 1876).

### **2.2.1.3 The West Coast Community: Les Vieux Français**

In the 1880s and 1890s the region again embraced new arrivals, this time from Brittany. These individuals, often young fishermen wanting to avoid military service, were fiercely independent; they refused to pay taxes and gave up the right to vote (Niederehe, 1991). Referred to nowadays as *les Vieux Français*, they became definitive and respected members of the Franco-Newfoundland community. Most married Acadian, Newfoundland or St-Pierrais women, although a few took English-speaking wives.

---

<sup>3</sup> Interestingly, Massignon (1962) notes that in Acadia the original family name was spelled Aucoin (Vol. 1, p.57). There is some speculation that the transition to the anglicised O'Quinn is a reference to the Celtic ancestors of the family who have been traced back to La Rochelle (Brittany, France).

<sup>4</sup> i.e. Mi'kmaq, the Beothuk being extinct at this time.



Brasseur notes that *les Vieux Français* could for the most part read and write in French although it was undoubtedly their second language, after Breton (Brasseur, 2001; 2007). French, however, was the vehicular language of the peninsula and it was quickly adopted. Brasseur (1994, 2001) proposes that they became, as such, a linguistic model for the slowly assimilating French population. Indeed, even today, speakers affiliate their French with *le français de France* (henceforth HF<sup>5</sup>) more than with the French from Québec (henceforth QF) (Brasseur, 1995).

*Les Vieux Français* also helped to form a collective identity against the English and assimilation. They joined the informal social structure of the community, bringing with them a rich tradition of music, storytelling, and celebrations (Thomas, 1983). They were thus able to help fortify the language and its cultural identity on the West Coast. The last of *les Vieux Français* passed away in 1987 (Brasseur, 1994, 2007; Magord, 1995a).

The Francophones of Newfoundland were, in effect, the only population to directly and indirectly receive “official” immigrants from France after the signature of the Treaty of Paris in 1763. The Acadian and French populations would both have an influence on the lexicology and the morpho-syntax of the variety of French spoken on the Port-au-Port peninsula (Brasseur, 2001; King, 1983, 1989; King & Butler, 2005; King & Nadasdi, 1987, 1995; Niederehe, 1991). The possible influences of regional varieties of HF and AF on the phonetic particularities of NF such as the centralisation of high vowels, the phonemic

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<sup>5</sup> Referring to Hexagonal French, the French considered the French of reference (the “norm”) and the most often studied in France.

opposition /e/ ~ /ɛ/, and the distinction between /a/ ~ /ɑ/, have been hypothesised (Brasseur, 2001; King, 1978; Lucci, 1969; Thomas, 1977). Nevertheless, their influence on the pronunciation of the variety has yet to be determined, as it has not been empirically substantiated.

### 2.2.2 The Effects of Isolation on NF

The Francophones lived in relative isolation on the West Coast of Newfoundland and, as a result of this geographical and linguistic isolation from the norm, the variety of French spoken on the peninsula was able to distance itself from the standard spoken in France (HF) (cf. Thomas, 1977).

In isolation there is limited language norming (c.f. Dorian, 1994; McMahon, 1994). Consequently, NF, as an oral language, was able to undergo an “organic” evolution. This quasi-rupture from the norm can provoke an “aging” of the language variety (Picoche & Marchello-Nizia, 1998). This is particularly noticeable in its lexicon. For example, Brasseur (2001) and Thomas (1977) reported the words *devinaille*, *besson*, and *nic* as archaic in HF, having been replaced respectively by *devinette*, *jumeau*, and *nid*. They note that these words have been conserved in NF. *Asteure* (maintenant) is also frequently used in NF, a word also found in XVI<sup>th</sup>-century texts by Montaigne (Thomas, 1977, p. 60), about the time of the initial French settlement of Newfoundland.

In isolation, a language variety can also undergo a divergent evolution from the norm through the creation of community-specific neologisms (Picoche & Marchello-Nizia, 1998). In NF, a significant portion of the vocabulary reflects maritime activities, and these words have also become applicable to activities in

daily life. For example, *chavirer*, “to tip a boat”, has also taken the meaning “to spill”. The morpho-syntax of NF has simplified, such as in the conjugation of verbs by analogical formation, as occurs in the absence of an educated standard (Brasseur, 2001; King, 1989, 1994; Thomas, 1977). The effect on the phonetics of the variety has yet to be objectively determined. Impressionistic observations will be discussed in greater detail in Section 2.3.2.

### **2.2.3 Languages in Contact**

Contact with Newfoundland English (henceforth NE) also had a role in the development and survival of NF. This section will examine the influence of formative institutions and employment on language choice on the West Coast.

#### **2.2.3.1 The Influence of English in Formative Institutions**

The influence of English on the sociolinguistic status of NF took two major forms. The first was the establishment of the Catholic Church in the region towards the end of the XIX<sup>th</sup> century. At the end of that century, one function of the Catholic Church was the construction of schools on the peninsula. Instruction, however, was provided in English (Brasseur, 1995; Thomas, 1977), which slowed children’s acquisition of all subjects because it was in a foreign language (Brasseur, 1995, 2001). Furthermore, as with most rural communities, schools were open only for part of the year, and the teacher rarely remained in the region longer than one or two years (Brasseur, 1995, 2007). The majority of Francophones therefore spent only a few months of the year at school (Thomas, 1977).

The second form of influence was the lack of governmental or institutional support. Clarke (1997) cites several reasons, including the small size of communities and the loss of occupational mobility: “With few exceptions, all essential services – schools, shops, the post office – have been provided to French Newfoundlanders uniquely in English, and virtually all persons of authority – doctors, magistrates, priests – have spoken only English” (King, 1989, p. 140). French was used for the most part only at home because the support of formative institutions such as the Church and the Education System assured English the dominant status.

The linguistic and cultural identity of the Francophones thus started to suffer (Magord, 1995b). In order to shelter their children from possible harassment, many parents curtailed the use of French outside the home because of “the ridicule to which they were subjected because of their accent” (Clarke, 1997, p. 14). As a result, the number of English speakers increased in the following generations and contributed to the overall weakening of the variety’s status.

#### **2.2.3.2 The Role of English and Employment in the Region**

Along with the use of English in formative institutions and the decreased use of the NF language variety outside the home for cultural reasons, employment opportunities also encouraged the use of English over French and further motivated bilingualism in the region. This section will examine the origin and the effects of these economic pressures on the linguistic status of NF.

In spite of the recent economic downturn and the partial emigration of its population, the early 1940s were catalytic for the West Coast region. The American army built an air force base in Stephenville that led to an economic gain for the region. Being able to speak English, however, was compulsory. Thus, in conjunction with the influx of English-speaking Newfoundlanders in search of employment, English became the language of choice for the community and the businesses that developed out of the economic “boom” (Clarke, 1997). According to Stoker (1964) this would be the greatest single factor undermining the French language in the province.

The moratorium on fishing that was imposed in 1992 had a dramatic effect on the economic and employment outlook for the entire province, and more so for the Francophones, whose livelihood was dependent on the industry (Magord *et al.*, 2002). Since then, there has been a massive loss of employment in the fishing industry, radically affecting employment opportunities for Franco-Newfoundlanders within their communities, which now have one of the highest unemployment rates in Canada<sup>6</sup>. This moratorium also prompted the most important emigration of close to 50% of the province’s population. Magord (1998) suggests that this also put into question the redevelopment of cultural activities initiated during the cultural renaissance of the 1970s.

The linguistic sentiment of the Franco-Newfoundlanders has mirrored, over the years, the economic situation on the Port-au-Port peninsula. No longer able to work within the Francophone community, members have been forced to

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<sup>6</sup> In 2001, the unemployment rate in Newfoundland and Labrador was 16.9% (Statistics Canada, 2001).

look outside for seasonal work. It should come as no surprise that, in NF, words borrowed from English are found in the fields of forestry and manufacturing, the seasonal industries in which the Franco-Newfoundlanders mostly participated. At the same time, the increase in the required use of English for employment led Franco-Newfoundlanders to develop a marked inferior linguistic sentiment (Brasseur, 1995, 2001, 2007; Magord, 1993, 1995a, 1995b, 1998; Thomas, 1977).

Factors such as the history of the population, the political climate of the region, the geographic and linguistic isolation on the peninsula, and the community population composition, are important considerations in establishing the linguistic status of a language variety; they have led to the development of a variety of French unique to the Port-au-Port peninsula (cf. Brasseur, 2001; Thomas, 1977). These factors all have the potential to influence not only the lexical and morpho-syntactic particularities, but also more importantly, the phonetic composition of NF. The next sections will examine statistical data and ethnolinguistic reports in order to provide a portrayal of the current linguistic status of French in Newfoundland.

#### **2.2.4 The Current Linguistic Status of NF**

The current status of NF in Newfoundland can be explained by an examination of population statistics and the use of the variety in local and provincial schools, media, and government. This will lead to a better understanding of the spread of the language and the population vitality.

#### 2.2.4.1 The French Population Dynamics in Newfoundland

In analysing the population statistics from three different censuses in the XX<sup>th</sup> and the XXI<sup>st</sup> centuries, it is possible to track the changes in the Francophone population in Newfoundland (see summaries provided by Tables 2 - 5<sup>7</sup>).

As recently as 1997, Clarke describes the province of Newfoundland and Labrador as “a socioeconomic and linguistic anomaly” (1997, p. 11) that demonstrates a veritable lack of linguistic diversity. That is, Newfoundland is essentially linguistically homogenous: 95% of the population reports English as their only maternal language (L1) and about 5% speak English and French (cf. Statistics Canada, 2006). Notably, the number of speakers of French in Newfoundland has decreased; for example between 1996 and 2006, there was a drop of 370 speakers, representing roughly 12% of the Francophone speaking population. Interestingly, the 550 speakers of Inuktitut in Newfoundland and Labrador in 2001 represented a community with almost twice as many speakers as the 330 French-English bilingual L1 speakers (cf. Table 3; Statistics Canada, 2001). This number increased between 2001 and 2006 from 550 to 595 speakers, whereas the number of French-English bilinguals decreased to 295 (cf. Table 3; Statistics Canada, 2006).

Notably, the decrease in the Francophone population was preceded by a very important increase in the Port-au-Port region, where the speakers of this study originate. In comparison to the provincial populations in Table 3, Table 2 illustrates the population change between 1951 and 1961 for the Port-au-Port

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<sup>7</sup> Statistics Canada (1951, 1961, 1971, 1981, 1991, 1996, 2001); Stoker (1964).

region, at this time heavily under the influence of the American Air Base in Stephenville. This most likely contributed to the increase in the influence of the English language in the region.

**Table 2: Population Statistics for the Port-au-Port region in Newfoundland (1951-1961)**

<i>COMMUNITY</i>	<i>1951</i>	<i>1961</i>	<i>POP. CHANGE</i>
<u>General Population</u>			
St. George's	2,305	3,187	+ 38%
Stephenville	6,036	11,124	+ 85%
Rest of peninsula	4,185	5,700	+ 36%

**Table 3: Maternal Language (L1) Statistics (1996, 2001, 2006)**

	<i>1996</i>	<i>2001</i>	<i>2006</i>
<b>Total Provincial Population</b>	<b>547,160</b>	<b>508,080</b>	<b>500,610</b>
French	2,275	2,180	1,885
English	538,700	499,750	488,405
Non-Official	5,465	5,495	9,540
French and English	300	330	295
French and a Non-Official	10	0	30
English and a Non-Official	405	310	435
Fren, Engl and a Non-Official	0	10	10

It is unfortunate that the population changes specific to this region have not been tracked since 1961 and reference must be made to provincial data. The next available census was from 1996, and a comparison of the data from this



census and that of 2006 reveals a decrease for the entire province in the number of French speakers (- 390) as compared to the number of English speakers (- 50,295) (cf. Table 2, Table 4). With the loss of its speakers, French is slowly disappearing. One must also consider the factor of emigration. Newfoundland's younger generations, both Francophone and Anglophone, are joining the general exodus to the rest of Canada. Judy Woods, president of the regional Francophone association in 2003, noted "as soon as our children are finished school they have to go away to work and their language is going with them" (Dubé, 2003, p. 3).

**Table 4: Percentage of Total Provincial Population of English-French Bilingual Speakers (1971- 2006)**

<i>Year</i>	<i>Percentage</i>
1971	1.8 %
1981	2.3 %
1991	3.3 %
1996	3.9 %
2001	4.2 %
2006	5.0 %

It is interesting to note that the number of individuals using French at home has remained stable, even though the number of native French speakers has decreased from 2,275 in 1996 to 1,885 in 2006 (cf. Table 3, Table 5). In fact, the percentage of bilingual individuals has steadily increased (by 3.2%) since 1971 to reach 5.0% in 2006 (cf. Table 4). Is this a case of an adaptation to the influence of English, without a complete loss of the French language, or simply speakers becoming adept in both languages? Magord (1998) notes that certain

Franco-Newfoundlanders working seasonally outside their communities would cite English as their principal language, since it would be used daily, even though they would speak French when at home. This trend seems to be reflected in the data from the 2001 Census, where 20,890 speakers in Newfoundland (4.11% of the population) report to have a working knowledge of both languages while only 3,040 speakers report using French at work<sup>8</sup>.

**Table 5: Language Most Often Spoken at Home (1996, 2001)<sup>9</sup>**

<i>LANGUAGE</i>	<i>1996</i>	<i>2001</i>	<i>% CHANGE</i>
<b>Provincial Population</b>	<b>547,160</b>	<b>508,080</b>	<b>-7.14</b>
French	880	895	+ 0.02
English	542,275	503,680	+ 0.02
French and English	255	190	- 0.01
Non-Official	3,270	2,890	- 0.03

The notions of “bilingual” and “Francophone” are relatively vague, and it is therefore impossible to determine with precision the level of bilingualism of speakers and at what level of proficiency they speak French; often, reported language use is a question of identity within a linguistic group. Statistics, therefore, cannot accurately paint the complete linguistic picture, but can nevertheless give an indication of the status of each of the languages in question.

<sup>8</sup> These numbers would also include a limited number of Federal Government employees living in St. John’s and requiring a working knowledge of both official languages. They are not available in the 2006 Census data at the time this manuscript was written.

<sup>9</sup> The figures are not available in the 2006 Census data at the time this manuscript was written.

#### 2.2.4.2 Revival and Self-Realisation

Since the 1970s, French has seen a certain revival in the region, arguably due to the influence of former Prime Minister Pierre Trudeau's language policies, Francophone associations, such as l'Association régionale de la côte-ouest, les Franco-Jeunes de Terre-Neuve et Labrador, and la Fédération des francophones de Terre-Neuve et Labrador, have been created and services, such as television (RDI) and radio (CBAF-16 Port-au-Port, CFPX, Radio-Canada<sup>10</sup>), have been introduced in French<sup>11</sup>. A Francophone education system was formally established: "As a result there has emerged in recent years a renewed sense of linguistic and cultural identity among French Newfoundlanders" (Clarke, 1997, p. 15).

The Francophone School Board now includes five schools in Newfoundland and Labrador. The School Board's policies include allowing the learner to master French as an L1, both in oral and in written forms, stimulating and strengthening the Francophone learner's sense of cultural and linguistic identity as a Francophone. These policies were officially outlined with the assistance of the Provincial and Federal Governments in conjunction with the Ministry of Education and Canadian Heritage in 1991 (Department of Education, 2001).

The sociolinguistic status of NF seems to have benefited from Franco-Newfoundlanders' increase in self-realisation and pride in their language and

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<sup>10</sup> Update: March 2009, CBC closed its French Radio Station in Corner Brook.

<sup>11</sup> The variety of French used is difficult to define. Radio-Canada and RDI are said to use a standardised Canadian French, but it is probable that the local radio stations on the Port-au-Port peninsula use NF.

culture. Musicians from the region such as the fiddler and storyteller Emile Benoit have garnered national and international attention. In March of 2007, Tony Cornect, MHA of the Port-au-Port region was the first to take the House of Assembly oath in French: "I wanted to express my culture to the rest of the province and I'm very, very happy I had the opportunity to do it" ("Port au Port MHA pledges oath in French", 2007). It remains to be seen if this renewal will continue to have an effect on the number of NF speakers.

The review has thus far provided a historical, political, demographic, and ethnolinguistic background of the population from which the variety of French under study originates, in order to situate the linguistic status of the variety. The following sections will further develop this characterisation by presenting and discussing the origins and the phonetic particularities of the variety from the existing scientific literature.

## **2.3 The Variety of French Spoken in Newfoundland on the Port-au-Port Peninsula: A Linguistic Characterisation**

### **2.3.1 Origins**

Because of the influence of immigrant populations, the lack of institutional support, and the loss of status, NF has remained an oral variety on the Port-au-Port peninsula, as outlined in previous sections. In spite of this, this is not an impoverished variety; it is considered unique and rich in its lexicology, morpho-syntax, and phonetics (Thomas, 1977). According to Magord (1995a), the French language in Newfoundland represents « la richesse d'une ethnicité franco-

terreneuvienne » (p. 106). This oral variety also differs from the international “standard”, as it evolved “almost completely free of the constraints usually imposed on regional forms of speech by an educated, literary standard” (Thomas, 1977, p. 36-37). Clarke (1997) historically situates the start of the language variety to the XV<sup>th</sup> and XVI<sup>th</sup> centuries with the arrival of the first settlers. It has been described as “a kind of Newfoundland creole, heavily seasoned with English words” spoken with an accent halfway between QF and English (Dubé, 2003); however the vowel formant frequencies of the variety have not been measured acoustically.

The next section gives an overview of the phonetic particularities of NF as described in studies published between 1977 and 2001, in order to determine the extent of the effect of isolation, education, employment, and linguistic pressures on NF. A more detailed discussion of the characteristics of the vowels of the French spoken in Newfoundland is included, particularly the vowels that are the focus of this study.

### **2.3.2 A Description of the Phonetic Particularities of NF**

The historical and the sociolinguistic contexts of the Francophone population on the Port-au-Port peninsula of Newfoundland suggest that the variety of French spoken could be distinct from other varieties of French in Canada.

The detailed description of the phonological system of NF is important for three main reasons. Firstly, the scientific literature contains a certain number of such descriptions, but they are sometimes vague and contradictory (Brasseur,

2001; King, 1978; Thomas, 1977). Secondly, several authors attribute phonetic particularities to the variety of French spoken in Newfoundland while affirming that it resembles the variety of French from Acadia (Brasseur, 2001; King, 1978; Thomas, 1977). An instrumental analysis could help support - or refute - such claims by providing empirical evidence for the presence of contextual variants, for instance. Thirdly, Brasseur (2001) states that the phonetic system of the French from Newfoundland is in “full evolution”<sup>12</sup> (2001, p. XXIX), and it would seem appropriate to commence documenting the changes that may occur in this variety with an analysis of spontaneous speech.

Although the consonant system of NF has also been described (Barter, 1986; Brasseur, 2001; King, 1978; Thomas, 1977), the most interesting and studied characteristics of NF seem to be related to its vowel system, in particular the high vowels /i/, /y/, and /u/, the mid unrounded vowels /e/ and /ɛ/, and the open vowels /a/ and /ɑ/. Thus, the acoustic analysis will focus on these vowels.

### 2.3.2.1 The Vowels of NF

The focus of the current study is the vowel system of NF, and in particular, seven of the most described and most characteristic vowels of the variety. This study will seek a more comprehensive description of the vowel system of this variety and will provide data to distinguish it from other varieties of French.

**The high vowels /i/, /y/, and /u/:** Thomas (1977), King (1978) and Brasseur (2001) state that the three phonemes /i/, /y/, and /u/ have two variants, where the closed (tense) variants [i], [y], and [u] are found in open syllables, and

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<sup>12</sup> “en pleine évolution”

the open (laxed) variants [ɪ], [ʏ], and [ʊ] (respectively) are found in closed stressed syllables in NF such as in the words [pɪp] *pipe*, [ʒɪʏp] *jupe*, and [ʃalʊp] *chaloupe*. These variants have typically been attributed to a release in tension and articulatory effort during pronunciation (Lyche, 2003, p. 242). This phenomenon is widespread in QF (Dolbec, Ménard, & Ouellon, 2003; Martin, 2002; Walker 1984; among others) and is considered to be in constant progression with the Francophones of Acadia (Lucci, 1969, 1972). The literature also mentions the presence of this phenomenon in certain varieties spoken in the north of France, whereas it is absent from HF (Dumas, 1987, cited by Dolbec et al., 2003). Certain authors have proposed that the occurrences of this phenomenon during the XVI<sup>th</sup> and the XVII<sup>th</sup> centuries in HF confirms that English could not be the cause of its introduction in these dialects (Dumas, 1987; Juneau, 1972).

**The mid unrounded vowels /e/ and /ɛ/:** Little has been written on the contextual variants of the anterior unrounded vowels of mid aperture (/e/ and /ɛ/) in NF, with the exception of Brasseur (2001), who has observed some variation which was noticeable in the production of /e/ as an [ɛ] in open final syllables ([kafɛ] *café*, [tɛ] *thé*). Léon explains that the phoneme /E/ in HF has two contextual variants [e] and [ɛ] which are found in complementary distribution. This phenomenon is known as the *Loi de position*: “Dans une syllabe accentuée fermée, la voyelle est ouverte et dans une syllabe accentuée ouverte la voyelle est fermée” (1992, p. 85). This rule predicts the presence of the variant [e] in the words *rangé*, *aimer*, etc. and of the variant [ɛ] in words such as *belles*, *sel*, etc.

Léon does, however, also note the presence of exceptions to this rule; the sound [ɛ] appears in open syllables in words with the spelling *-et, ais, ait, aid, aient, aix*, as in the words *ballet, jamais*, and *chantait* (1992, p. 86) resulting in the possibility of a phonological opposition with [e], as in *balai*.

In QF, the phonological opposition between the sounds [e] and [ɛ] in open syllable is maintained, whereas in closed syllable only the variant [ɛ] is present (Dolbec et al., 2003; Martin, 1998). A supplementary variant is present in QF, where [ɛ] can become [æ] in open stressed syllable or in front of /R/ followed by a consonant, as in *prét* [pʁæ], *verte* [væʁt]. Moreover, in QF, the phonological opposition between these two variants [e] ~ [ɛ] is reinforced by a lengthening of the variant [ɛ] in certain contexts which can even go as far as diphthongisation as in *tête* [tɛ:t]/[tæ<sup>ɛ</sup>t] and *fête* [fɛ:t]/[fa<sup>ɛ</sup>t] (Walker, 1984).

Lucci (1969) asserts that the phonemic opposition /e/ ~ /ɛ/ in NF is similar to that found in AF and HF. He also claims that the phonemic opposition in open stressed syllable is strong and stable in AF, as it is systematically used to make the distinction between verb tenses (infinitives or past participles [e] and imperfect [ɛ]) (1972, p. 44). However, he also notes the presence of the variant [e] in final syllables closed by a consonant in the words *bière, étrangère, mère*, and *père*. In syllables closed by a consonant other than /r/, there is a neutralisation of this vowel opposition, and the variant [ɛ] appears.

**The low vowels /a/ and /ɑ/:** In NF, Brasseur (2001) states that the phonological opposition /a/ ~ /ɑ/ is maintained: « L'opposition phonologique /a/ ~



/a/ se maintient généralement bien en français terre-neuvien » (p. XXIX). He notes the pronunciation of [ɑ] in final ([bRɑ] *bras*) and non-final open syllable ([amare] *amarrer*) as well as for the spelling *oi* in final syllable ([dwa] *doigt*).

In contemporary HF, the contrast between the low vowels is disappearing as a result of its weak phonological opposition. Léon (1992) declares that the production of the vowel /a/ is in fact rare because orthoepically it only represents 2.4% of the low vowels pronounced in speech, whereas the vowel /ɑ/ represents 97.6% (p. 87). In France, the use of the vowel /a/ is considered regional and is infrequent (Léon, 1992, p. 89).

In QF, however, the distinction between the low vowels /a/ ~ /ɑ/ is still maintained (Dolbec et al., 2003; Walker, 1984). “Canadian” French, according to Walker, does not allow the presence of [ɑ] in final open syllable, where in final stressed syllable it is neutralised and pronounced as [ɑ] or even as extremely as [ɔ] (1984, p. 78-79) and diphthongs can also occur (Dolbec et al., 2003). This can be found in words such as *pas* and *tas* and uttered as [pɔ] and [tɔ]. In a syllable closed by a non-lengthening consonant, however, /a/ can be released as the fronted allophone [æ] as in *patte* [pæt] (Walker, 1984, p. 79), whereas /ɑ/ would be longer and more likely to diphthongise as [pɑ<sup>w</sup>t] (Walker, 1984, p. 80). Speakers of QF tend to pronounce [ɑ] in final stressed position (unstressed *sa* [sa] vs. stressed *fait ça* [fɛsɑ]), or if the vowel is followed by a lengthening

consonant in the same syllable (/far/ *phare* [faR], *barre* [baR] vs. *barrer* [baRe]), or if the vowel is etymologically or historically long (ex. *éage* > *âge* and in forms such as *-aille*, *-ail* [aj]), except if the syllable is repetitive (*papa*) (Dolbec et al., 2003). Again, diphthongisation can occur.

In AF, the distinction /a/ ~ /ɑ/ is maintained in closed syllable (*patte* [pat] ~ *pâte* [pat]). In addition, Lucci (1972) also mentions that the posterior vowel /ɑ/ is pronounced more towards the back of the vocal cavity than in HF: “il s’articule plus en arrière que le /ɑ/ français lorsqu’il existe... en acadien [où] /ɑ/ s’articule au même niveau que /ɔ/, et parfois plus en arrière” (Lucci, 1972, p. 63). However, AF does not allow the pronunciation of [a] in open final syllable (*ma*, *mât*), and as a result the pronunciation of [ɑ] is more frequent (Lucci, 1972).

#### 2.3.2.2 Diphthongisation in NF

In the French from Newfoundland, there are, once again, two views when diphthongs are discussed. A diphthong is, “a vowel where there is a single (perceptual) noticeable change in quality during a syllable” (Crystal, 1997). Brasseur (2001) observed diphthongs only in Cap St-George, on the Port-au-Port peninsula, and even there infrequently. He suggests that this is most likely due to the recent contact with popular QF ([malɑ<sup>u</sup>d] *malade*, [mɛ<sup>i</sup>s] *messe*, [afa<sup>ɛ</sup>R] *affaire*) (p. XXXIII). King (1978), meanwhile, states that there are five examples of diphthongisation in NF: The diphthong [a<sup>i</sup>], for example, is present in words borrowed from English ([alrait] *alright*) (p. 17). King also reports that the presence

of [ɛ:<sup>æ</sup>] is less frequent in front of /R/ in closed syllable ([afɛ:æR] *affaire*), or [ɔ], which is sometimes considered an allophone of the longer vowel [o]. The two variations [ɛ<sup>v</sup>] or [ɛI] are sometimes found in closed syllable and are allophones of /ɛ/ (*têter* (taquiner), *fête*, *la neige*) (p. 17). King also notes they are more frequently pronounced by the speakers of the younger generations, whereas older speakers would tend to pronounce these words with [ɛ:].

Dowd, Smith, and Wolfe (1997) state, however, that standard spoken French in France (HF) has pure spoken vowels. HF is, according to Lucci (1972), pronounced using a high degree of muscular tension, which is one of the reasons it has no diphthongs, since an increase in muscular tension increases the stability of the pronounced sounds (p. 131). Le Clézio (1989) agrees, remarking, “French does not possess diphthongs” (p. 68). However, he goes on to note that regardless of the length of some French vowels, it is unlikely that the quality of the vowel would not alter somewhat during its pronunciation. Diphthongs are, nonetheless, present in Canadian French, specifically QF, in stressed syllables, *casse* [ka<sup>w</sup>s], those closed by a lengthening consonant, *arrive* [ari<sup>v</sup>], *père* [pe<sup>r</sup>], or those with an etymologically long vowel such as *pâte* [pa<sup>w</sup>t] (Dolbec et al., 2003; Dumas, 1986; Walker, 1984, p. 65).

Lucci (1972) qualifies the French from Acadia as being “relaxed” - more relaxed than HF, but less so than English. An absence of muscular tension and stability in the pronunciation of a vowel would make it more prone to diphthongisation. It has been said that there is very little diphthongisation in AF, of which the AF from New Brunswick is an example, thereby distinguishing it

from QF (Motapanyane, 1997). Still others state that diphthongisation is frequent in AF (King, 1978; King & Butler, 2005) or present in some idiolects as allophones of “higher mid and high oral vowels... occurring primarily in stressed syllable” (Lucci, 1969, p. 191).

To summarise, the preceding two sections highlight the presence of three main characteristics under observation in the vowels of NF, as they have been previously observed in impressionistic studies of NF (Brasseur, 2001; King, 1978; Thomas, 1977) and as they are notable characteristics of AF, QF, or HF (Dolbec et al., 2003; Léon, 1992; Lucci, 1969, 1972; Lyche, 2003; Martin, 1998, 2002, Walker, 1984). These characteristics include 1) the presence of the contextual variants [I], [Y], and [U] of corresponding high vowels in QF and with the younger generation in AF, 2) the tendency in HF toward an absence of phonological oppositions between the mid front vowels /e/ ~ /ɛ/ (except in open syllable) and between the low vowels /a/ ~ /ɑ/, whereas in QF and AF the tendency is to maintain them and in the case of QF to even stress them with diphthongisation, and 3) the possibility of the presence of diphthongs in NF, since diphthongs are a major characteristic of QF, although they are not present in either HF or AF.

The vowels chosen for the purpose of this study are the most described in the linguistic literature. They are also those that would contribute to a better description of NF (Brasseur, 2001; King, 1978; Thomas, 1977).

## 2.4 The Current Study

The literature review has revealed past political, demographic, geographic, and sociolinguistic conditions of the Francophone population of Newfoundland that have shaped and characterised the linguistic status of the variety of French spoken in Newfoundland. The scientific literature has also revealed impressionistic lexical, morpho-syntactic, and phonetic descriptions of the variety.

A detailed description of the phonological system of NF is important for three main reasons: 1) there has been no consistent detailed description of the variety by instrumental analysis, 2), several authors attribute phonological particularities to NF while affirming that it resembles AF (Brasseur, 2001; King, 1978; Thomas, 1977), and 3) Brasseur (2001) states that the phonological system of NF is evolving (2001, p. XXIX), although no acoustical data has been provided to support this claim. For these reasons, the phonological variation of the seven vowels chosen for the purposes of this study and described in the scientific literature should be acoustically and objectively characterised based on a current corpus of spontaneous speech.

Three main observations can be made from extant descriptions of the NF vocalic system in the scientific literature. Firstly, in NF, Thomas (1977), King (1978), and Brasseur (2001) state that high vowels /i/, /y/, and /u/ have open contextual variants [ɪ], [ʏ], [ʊ] respectively in closed stressed syllables. Lucci (1969) confirms this tendency in AF. Acoustic data would confirm or refute the possible presence of open contextual variants for these high vowels. Secondly, the mid unrounded vowels /e/ and /ɛ/ may or may not be in phonological

opposition. Brasseur (2001) notes the opening of [e] in open final syllables ([kafɛ] *café*, [tɛ] *thé*). No other author having described this variety mentions a phonological opposition or contextual variants. In HF, where these vowels are contextual variants, [e] is found in open syllables (*français* [frãse]), and in contrast, [ɛ] is present in closed syllables (*française* [frãsɛz]). An examination of a recent corpus would identify the contexts in which these two vowels are found and as a result verify the presence of contextual variants in NF. Furthermore, the identification of contextual variants would also permit the comparison with other varieties of French with regard to the *Loi de position*. Thirdly, the phonological opposition /a/ ~ /ɑ/ seems to be maintained in NF, as in QF and AF, whereas this opposition has effectively disappeared in HF (Brasseur, 2001). Objective analysis of acoustic data would also confirm the status of the vowel [ɑ] and the possible opposition of the low vowels /a/ ~ /ɑ/.

The motivation for the present study lies in the lack of empirical acoustical data for the vocalic system of NF. This empirical data would provide a means of objectively characterising these NF vowels and allow their comparison with data for other varieties of French. Based on the previously-discussed lack of quantification of the vocalic system, the comparison with Acadian French and the evolution of the variety, the present investigation aims to answer the two questions: 1) How is NF characterised by its vowels? and 2) Is NF really an Acadian variety as stated by Brasseur (2001), King (1978), King & Nadasdi (1987), Magord (1995), and Thomas (1977)?

This study aims to quantify seven of the vowels from NF in order to address the above questions by providing an objective acoustic analysis. The acoustic analysis of the seven chosen vowels under the effect of both stress and syllable structure will allow their empirical characterisation and will permit a comparison with acoustic values already established for other varieties of French: HF (Tubach 1989), QF (Gendron, 1966; Martin 2002), and AF (Lucci 1969,1972).

## **3 METHODOLOGY**

### **3.1 Objectives**

An objective analysis can greatly assist in determining the exact nature of the phonetic system (NF) as well as the degrees of separation between the system and that of three other varieties of French (AF, QF and HF). Objectivity will be maintained in this study through the anonymity of speakers and the use of a standardised procedural methodology and analysis.

### **3.2 Speech Material**

#### **3.2.1 The Present Corpus**

The present corpus is made up of recording extracts made by Magord in 1990 and Benoit in 1993, obtained from Memorial University of Newfoundland's Folklore Archives, and deposited in the archives by the researchers themselves. They were obtained through visits to the archives in August 2003 and 2004 with the permission of Dr. Gerald Thomas and with the assistance of the Archivist-Librarian (Patricia Fulton).

##### **3.2.1.1 Subjects**

The data chosen for the purposes of this study consist of interviews and folktales told by three male speakers (S1, S2, and S3). From this pre-existing sample, only the modern recordings (1990 onwards) of native speakers of French in spontaneous speech situations with relatively little noise were



considered for the purposes of this study, as one of the goals is to characterise modern NF. This author considers the recordings to be representative tokens of the French spoken on the West Coast of Newfoundland. Male speakers were chosen for ease of comparison with phonetic values previously reported in the scientific literature.

It is important to note here that the three main communities on the Port-au-Port peninsula (Cap St-Georges, La Grand'Terre, and L'Anse-à-Canards) have been described as "*une population francophone homogène*", "a homogenous Francophone population" (cf. Brasseur, 2007; Magord, 1995, p. 95). All three speakers chosen were born and were still living on the Port-au-Port peninsula. As a result, recordings considered for use in the current study represented speakers from all three communities. Of the twelve possible speakers available from the pool of high quality current recordings, three were chosen. These speakers had produced semi-spontaneous speech of a minimum of one-hour duration; the recordings displayed relatively little noise and were of an acceptable quality for acoustic analysis.

### **3.2.1.2 The Magord and Benoit Recordings**

The recordings chosen for the purposes of this analysis were done using similar methodologies of recording and eliciting information and speech.

The first set of recordings, the Magord<sup>13</sup> recordings, was made over the summer of 1990 (May-June) using a Sony TC 142 tape recorder, recording on Studio LH 60 and AVX 60 cassette tapes at a recording speed of 1 7/8 ips. The

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<sup>13</sup> The reader can refer to Magord (1995, 1998) for a more detailed description of the corpus.

second set of recordings, the Benoit recordings, were made in November 1993 using a SKC 60 cassette tape at the same recording speed of 1 7/8 ips.

The interviews made by Magord consist of semi-spontaneous speech elicited through open-ended questions targeting the past and current status of French on the peninsula. The Benoit recording consists of a telling of a Franco-Newfoundland folktale by the speaker and open-ended questions asked by Benoit eliciting semi-spontaneous speech on the part of the speaker.

### **3.2.1.3 The Final Word Count**

The corpus is made up of words extracted from three hours of taped conversation and identified through an initial transcription of the recordings by this researcher. Words stressed by insistence or exclamation, words that were incomprehensible, and words containing interference from background noise were eliminated. Of the total word count from the transcriptions, 454 words were chosen to make up the final corpus: 123 from S1, 181 from S2, and 150 from S3. Table 6 shows the breakdown of vowels per type of syllable and position within the isolated word. Most notable was the absence of words containing the vowel /e/ in closed syllable and the number of words containing [a] and [ɑ].

**Table 6: The Total Vowel Count for This Study**

Vowel	Open syllable						Closed syllable						Total
	Stressed			Unstressed			Stressed			Unstressed			
	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	
[i / I]	5	9	9	5	10	7	7	10	10	2	2	2	<b>78</b>
[y / Y]	5	10	7	2	10	3	5	10	6	2	4	1	<b>65</b>
[u / U]	5	9	7	9	10	10	5	10	10	3	3	3	<b>84</b>
[e]	6	10	6	2	10	10	0	0	0	0	0	0	<b>44</b>
[ɛ]	8	7	6	8	7	2	10	10	10	6	10	3	<b>87</b>
[a]	4	3	5	9	10	10	6	10	10	6	3	6	<b>82</b>
[ɑ]	1	1	3	2	1	2	0	2	2	0	0	0	<b>14</b>
<b>Total</b>	<b>34</b>	<b>49</b>	<b>43</b>	<b>37</b>	<b>58</b>	<b>44</b>	<b>33</b>	<b>52</b>	<b>48</b>	<b>19</b>	<b>22</b>	<b>15</b>	<b>454</b>

Note: The vowels in this table represent the pronunciations anticipated for the tokens according to the orthoepic norms of HF that have been verified in *Le Petit Robert*.

### 3.3 Analytical Procedure

Formants one, two, and three were measured in open and closed syllables in order to initially situate the acoustic characteristics of the vowels /i/, /y/, /u/, /e/, /ɛ/, /a/, and /ɑ/ on the vocalic triangle.

For the purposes of this study, the words were isolated and extracted from the recordings constituting the corpus by digitising the speech played on a Marantz, model # PMD-430, series # 180348. Every effort was made to ensure the quality of the recordings was preserved. Subsequently, in order to facilitate analysis, the target words were isolated and saved as individual CSL native files using the program Computer Speech Lab, Model 4300B, designed to analyse

speech signals. These excerpts were digitised using the sound card provided with this particular model which samples speech at the rate 11.5 kHz. Coding of subject word files was done to preserve speaker anonymity and researcher objectivity.

### 3.3.1 Measurements

In order to characterise the vowels of NF, an acoustic analysis of vowel formants was undertaken. The formants of a vowel are reinforced harmonics of a fundamental tone ( $F_0$ ) in a complex waveform (cf. Dubois *et al.*, 2001), and the combination of these formants distinguishes vowel quality. As a result, these formants are a more accurate method of describing vowels than the traditional articulatory phonetic labels (ex. high-low and rounded-unrounded). Traditionally, acoustic analyses utilise the first two formants, although a third can be used for a more accurate description.

In order to accurately measure vowel formants, a steady-state portion of the signal needs to be identified. Using Linear Predictive Coding (LPC), each vowel was isolated and subsequently marked and tagged. The onset and the offset of the vowel, as well as the onset and the offset of the steady-state portion of the vowel, were tagged. The steady-state portion lies between the zero-point of the first period of full spectral energy and the zero-point of the last period of full spectral energy when there is a loss of a consistent waveform related to the decrease in energy of formants two and three (Flege, 1984; Shah, 2002). Measures were taken with the assistance of a waveform representation and

confirmed with a spectrogram as well as a formant vowel overlay performed by the software.

Next, the durations of the complete vowel and of the steady-state were noted. The steady-state portion of the vowel was divided into four equal lengths and three points were labelled accordingly:  $t_1 = \frac{1}{4}$ ,  $t_2 = \frac{1}{2}$ , and  $t_3 = \frac{3}{4}$ .

Formant values at points  $t_1$ ,  $t_2$ , and  $t_3$  were then taken. Formant measures for  $F_1$ ,  $F_2$ , and  $F_3$  at each of these points were first taken using the LPC analysis. Next, the formant values were extracted and confirmed by their identification and measurement on the spectrogram. Formant values at the mid-vowel point ( $t_2$ ) were used for analysis and comparison with values from other varieties of French (See Section 3.3.2 The Vowels Under Study). This point was chosen in order to limit possible co-articulatory effects that modify the initial and final parts of segments.

Occasional segmentation difficulties were encountered in the definition of vowel and steady-state onset and offset as a result of the phonetic environment in which the vowel was situated. Words with vowels in this situation, along with words containing liquids, glides or nasal vowels that posed segmentation difficulties were therefore excluded from the analysis.

### **3.3.2 The Vowels Under Study**

The vowels [i], [y], [u], [e], [ɛ], [a] and [ɑ] were chosen because they are the most described of the variety in the majority of NF variety studies (Brasseur, 1994, 2001; King, 1978, 1989; King & Butler, 2005; Thomas, 1977) and because they are the vowels that tend to vary most often from one dialect to another while

at the same time retaining an acoustically consistent and identifiable pattern. These vowels were isolated from open and closed, stressed and unstressed syllables. Formants one, two, and three were measured in order to initially situate the vowels on the vocalic triangle. This would permit a comparison with acoustic values already established for other varieties of French: HF (Tubach, 1989), QF (Gendron, 1966; Martin, 2002), and AF (Lucci, 1972). Martin (2002), Gendron (1966), and Lucci (1972) noted the geographical origins of the speakers in their studies.

Values from Tubach (1989), although similar to other measurements given for French (cf. Delattre, 1981), are not explicitly geographically defined. The speakers are simply labelled as “French”. For this reason, these values were compared to other studies (Delattre, 1981; Martin, 2004) and found to be similar. Delattre (1981) does not explicitly note that the speaker of his study is French from France, but in another study done the same year he does note the geographical origin, the north of France. Therefore it is reasonable to assume that the speaker is of the same origin in both studies. The current study uses the values of Tubach (1989) since they are comparable to the older values of Delattre (1948, 1966, 1981) which can be understood as the French from France (HF).

### **3.3.2.1 The High Vowels [i], [y], and [u]**

Formant values of the vowels [i], [y], and [u] for NF were measured in stressed and unstressed position, as well as open and closed syllables within each position. A total of 227 words, representing all positions, were isolated from

the current corpus. The formant values for the high vowels of HF, QF, and AF as presented in the literature are noted in Table 7.

**Table 7: Representative Formant Values for the Vowels [i], [y], and [u]**

<i>Variety of French</i>	<i>Vowel</i>	$F_1$	$F_2$	$F_3$
<b>HF</b> (Tubach, 1989)	<b>[i]</b>	308 Hz <sup>14</sup>	2064 Hz	2976 Hz
	<b>[y]</b>	300 Hz	1750 Hz	2120 Hz
	<b>[u]</b>	315 Hz	764 Hz	2027 Hz
<b>QF</b> (Martin, 2002)	<b>[i]</b>	250 Hz <sup>15</sup>	2053 Hz	--- <sup>16</sup>
	<b>[y]</b>	257 Hz	1822 Hz	---
	<b>[u]</b>	259 Hz	751 Hz	---
<b>AF</b> (Lucci, 1972)	<b>[i]</b>	320 Hz/ 400 <sup>17</sup> Hz	2000 Hz/ 2440 Hz	2280 Hz/ 3360 Hz
	<b>[y]</b>	280 Hz/ 400 Hz	1520 Hz/ 1640 Hz	2080-2240 Hz/ 2360 Hz
	<b>[u]</b>	290 Hz	960 Hz	--- <sup>18</sup>

### 3.3.2.2 The Mid unrounded Vowels [e] and [ɛ]

Formant values of the vowels [e] and [ɛ] for NF were measured in open, closed, stressed and unstressed syllable. A total of 131 words were isolated from the current corpus and the evaluation of the presence of a phonological contrast would be made using this sample.

The distinction between the unrounded vowels [e] and [ɛ] for HF was made according to the rules of complementary distribution which say that in

<sup>14</sup> Delattre (1981) gives values similar to those of Tubach (1989) and Martin (2005) for  $F_1$  and  $F_2$ . He gives no values for  $F_3$ .

<sup>15</sup> Martin (2002) cites values for  $F_1$  and  $F_2$ . These are approximately confirmed by those of Gendron (1966) for vowels in closed syllable/open syllable.

<sup>16</sup> The author presented no data for these values for [i], [y] and [u].

<sup>17</sup> These values represent the range noted by Lucci (1972). They were made over two measurements of long vowels of a single speaker. Lucci (1972) does not present these values as absolute, rather as relative values permitting the comparison of long and short vowels within the same speaker.

<sup>18</sup> The author presented no data for this value for [u].

closed stressed syllable [ɛ] is present and in open stressed syllable it is [e] which is present. Exceptions to these rules are based on spelling, that is, words ending in -âit, -ait, -ais, -aix, and -aient will be theoretically pronounced with /ɛ/ in open stressed syllable. The *Dictionnaire Robert* was consulted in the case of an ambiguous word ending.

The formant values for the mid unrounded vowels of HF and QF presented in the literature are reproduced in Table 8. No comparable values for AF were available. As a result, it is assumed, according to impressionistic observations in the scientific literature (Brasseur, 2001; King, 1978; Thomas, 1977), that these vowels are in complementary distribution.

**Table 8: Representative Formant Values for the Vowels [e] and [ɛ]**

<i>Variety of French</i>	<i>Vowel</i>	$F_1$	$F_2$	$F_3$
<b>HF</b> (Tubach, 1989)	<b>[e]</b>	365 Hz <sup>19</sup>	1961 Hz	2644 Hz
	<b>[ɛ]</b>	530 Hz	1718 Hz	2558 Hz
<b>QF</b> (Martin, 2002 <sup>21</sup> )	<b>[e]</b>	349 Hz	2023 Hz	--- <sup>20</sup>
	<b>[ɛ]</b>	461 Hz	1768 Hz	---
<b>AF</b> (Lucci, 1972)	<b>[e]</b>	---	---	---
	<b>[ɛ]</b>	---	---	---

<sup>19</sup> Delattre (1981) gives values similar to those of Tubach (1989) and Martin (2005) for  $F_1$  and  $F_2$ . He gives no values for  $F_3$ .

<sup>20</sup> The author gives no values for [e] and [ɛ].

<sup>21</sup> Martin (2002) cites values for  $F_1$  and  $F_2$  similar to those of Gendron (1966), who cites approximate values for « short » and « long » vowels, but only for values of  $F_1$  and  $F_2$ .



### 3.3.2.3 The Low Vowels [a] and [ɑ]

Formant values of the vowels [a] and [ɑ] for NF were measured in stressed, unstressed, open and closed syllables. The 96 words isolated would determine the presence of contextual variants in the French from Newfoundland for these two vowels. Table 9 presents the formant values for HF and QF from the literature. Again, no comparable values for AF were available.

**Table 9: Representative Formant Values for the Vowels [a] and [ɑ]**

<i>Variety of French</i>	<i>Vowel</i>	$F_1$	$F_2$	$F_3$
<b>HF</b> (Tubach, 1989)	[a]	684 Hz <sup>22</sup>	1256 Hz	2503 Hz
	[ɑ]	--- <sup>23</sup>	---	---
<b>QF</b> (Martin, 2002 <sup>25</sup> )	[a]	671 Hz	1463 Hz	--- <sup>24</sup>
	[ɑ]	607 Hz	1162 Hz	---
<b>AF</b> (Lucci, 1972)	[a]	---	---	---
	[ɑ]	---	---	---

### 3.3.2.4 Diphthongs

During the analysis the main experimenter noticed the presence of vowels that seemed to be diphthongised and, because this may help characterise NF, it was deemed necessary to examine this matter a little further.

<sup>22</sup> Delattre (1948) gives values similar to those of Martin (2005) for  $F_1$  and  $F_2$ . He gives no values for  $F_3$ .

<sup>23</sup> Tubach (1989) gives no values for this vowel. Delattre (1981) gives values of 750Hz and 1200Hz and Martin (2005) gives values of 710Hz, 1230Hz and 2700Hz.

<sup>24</sup> The author gives no values for [a] and [ɑ].

<sup>25</sup> Gendron (1966) cites approximate values for « anterior » (*il boit*: 400 Hz and 1000 Hz) and « posterior » (*pâte*: 300 Hz and 1000 Hz) vowels, but the values are only given for  $F_1$  and  $F_2$ . He also gives values for a vowel he calls the « Canadian a » (*part*): 300 Hz and 950 Hz (p. 93).

There is no agreement in the scientific literature as to the acoustic cues that precisely define a diphthongised vowel. Although it is known that a diphthongised vowel will display variation in its formant structure, the extent of variation that would trigger the perception of a diphthong has not as yet been experimentally proven.

However, Schouten and Peeters (2000) have noted that “the second formant of a diphthong usually covers between 200 and 400 Hz” (p. 20). Based on this observation, a comparison of the relative change in  $F_2$  over the length of the steady-state portion ( $\frac{1}{4}$ ,  $\frac{1}{2}$ , and  $\frac{3}{4}$ ) of the vowel could indicate the presence of a diphthongised vowel. For the purposes of the current study, minimum variations of 200 to 400 Hz will be considered indicative of the presence of diphthongised vowels.

The following equation was used to calculate the change in  $F_2$  value over the course of the vowel’s emission. The diphthong is a mathematical function of the change in  $F_2$  between the points  $t_1$  and  $t_3$  of the vowel.

**Equation 1: Diphthong =  $f(x) \Delta F_2$ ; where  $\Delta F_2 = (t_3 - t_1)$**

## **4 RESULTS**

### **4.1 Introduction**

This chapter will provide results from the current acoustical analysis of vowels [i, y, u, e, ε, a, and ɑ] in NF. In this chapter each of the vowel environments is treated separately. In particular, the results of the steady-state measurements of  $F_1$  and  $F_2$  will be presented as differentiators of NF vowels. The analysis will investigate if factors such as stress and syllable structure affect formant frequency. Recall from Chapter 3 that the vowels presented here (ex. [i], [e], [a], etc) are representative of the orthoepic norm for the token.

The first part of this chapter will present the average formant values for the seven vowels under study obtained in the current analysis. The three subsequent sections will present the results for the high, mid, and low vowels respectively.

### **4.2 Average Formant Values**

#### **4.2.1 Average Formant Values of NF**

The purpose of this initial section is to examine the average values of the first two formants for all vowels and for all speakers under study.

From the results presented in Table 10 (cf. page 50) and in Figure 2, three observations can be made. Firstly, the overall shape of this acoustic representation in Figure 2 shows correspondence to the traditional form documented for other varieties of French (Carton, 1974; Malmberg, 1963). This

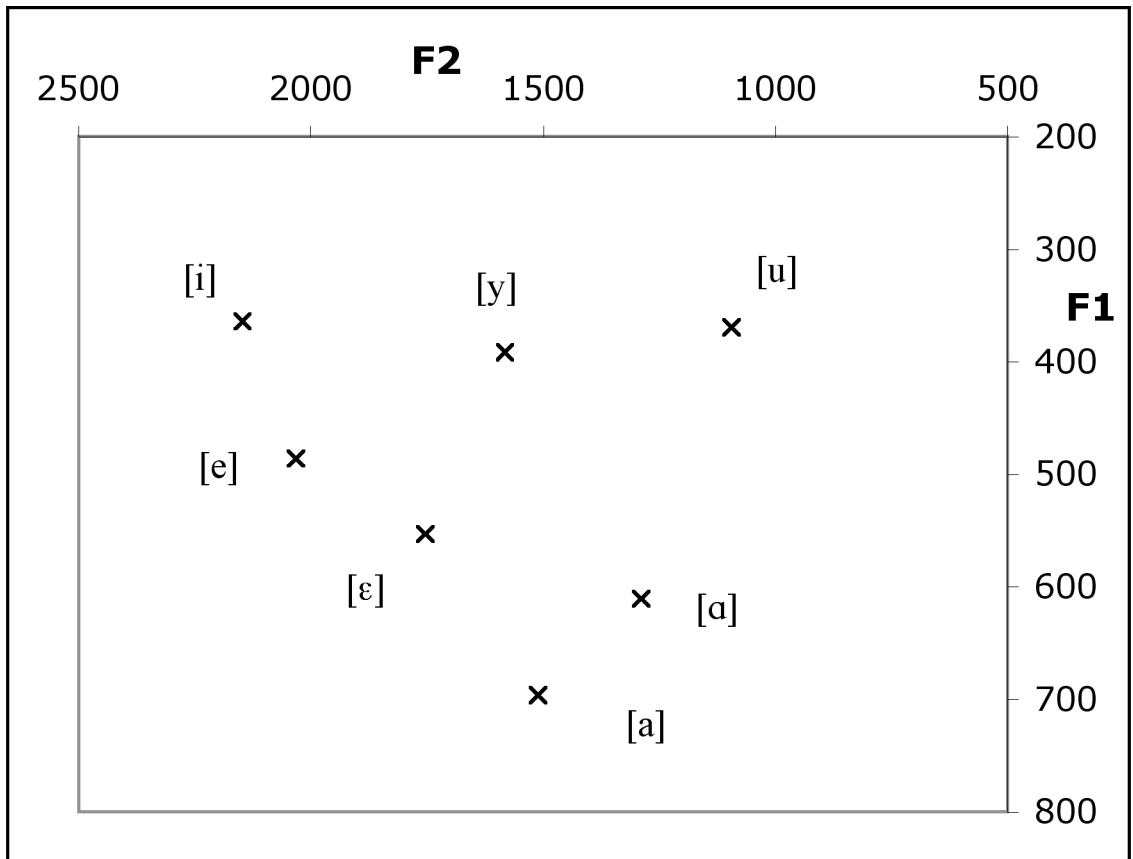
implies, for instance, that the high vowels [i] and [u] have a comparable  $F_1$  value, and it is their  $F_2$  values that clearly differentiate them. This can also be said for the mid unrounded vowels [e] and [ɛ].

Secondly, there is a clear distinction in Figure 2 between [a] and [ɑ], in both  $F_1$  and  $F_2$ . Notably, the position of [a] appears to be central rather than anterior as in more traditional articulatory vowel representations of French.

Thirdly, this vowel triangle is slightly shifted downwards compared to the values provided in the literature. This is because NF  $F_1$  values are higher than those for HF obtained by Tubach (1989), as well as those obtained for QF (Martin, 2002) and for AF (Lucci, 1969, 1972), even though the range seems to be comparable. One example of this would be the high vowel [i]: in NF,  $F_1$  is 364 Hz, in HF  $F_1$  is 308 Hz, in QF  $F_1$  is 250 Hz and in AF  $F_1$  is 320 Hz (see Table 21 for values for all vowels studied).

Comparisons will be made between all four varieties of French, and will be discussed in greater detail in subsequent sections, in order to provide evidence to support assertions that link NF to or that distinguish NF from one or more of HF, QF, and/or AF.

**Figure 2: Vowel Triangle Corresponding to the Average Formant Frequencies (in Hz) of Seven NF Vowels**



At this point, it seems relevant to comment on the dispersion of these vowels, since average values cannot provide the full picture of the actual results (see Appendix B). As expected, there is a relatively large dispersion for the majority of these vowels, especially for [i] and the mid unrounded vowels [e] and [ɛ]. Extreme examples of this dispersion include tokens of [i] and [ɛ], which overlap with [u], for instance. In addition, boundaries between vowels, which are indicative of the perception of a different vowel quality, are not always clear. These results are not surprising considering that the current study makes use of spontaneous speech, which typically presents more variation than laboratory

speech. In addition, these vowels are labelled according to the orthoepic norm, which does not take into account speakers' missed targets.

In an attempt to provide a more accurate description of the vowels under study the next two sections will examine the effect of stress and syllable structure on vowel formant frequency.

#### **4.2.2 The Effect of Stress on Vowel Formant Frequency**

It is generally accepted that unstressed syllables will be uttered differently than stressed. For instance, unstressed syllables will be shorter and the vowels in these syllables may display some centralisation because of a decrease in the articulatory energy. In languages such as English, where stress makes a distinction between lexical items ('record ~ re'cord, 'object ~ ob'ject), this distinction between syllables is evident. In French, however, primary stress is found only on the final syllables of lexical items (Fonagy, 1979) and its only reported effect is an increase in syllable duration (Léon, 1992; Wenk & Wioland, 1982).

It was deemed important to examine the effect of stress, because, as was mentioned in the linguistic description of NF (Chapter 2), stress is one of two main factors that can determine the presence of contextual variants. Thus, this section will examine the effect of stress on the production and the perception of vowel formant frequencies, as well as the dispersion of their realisation.

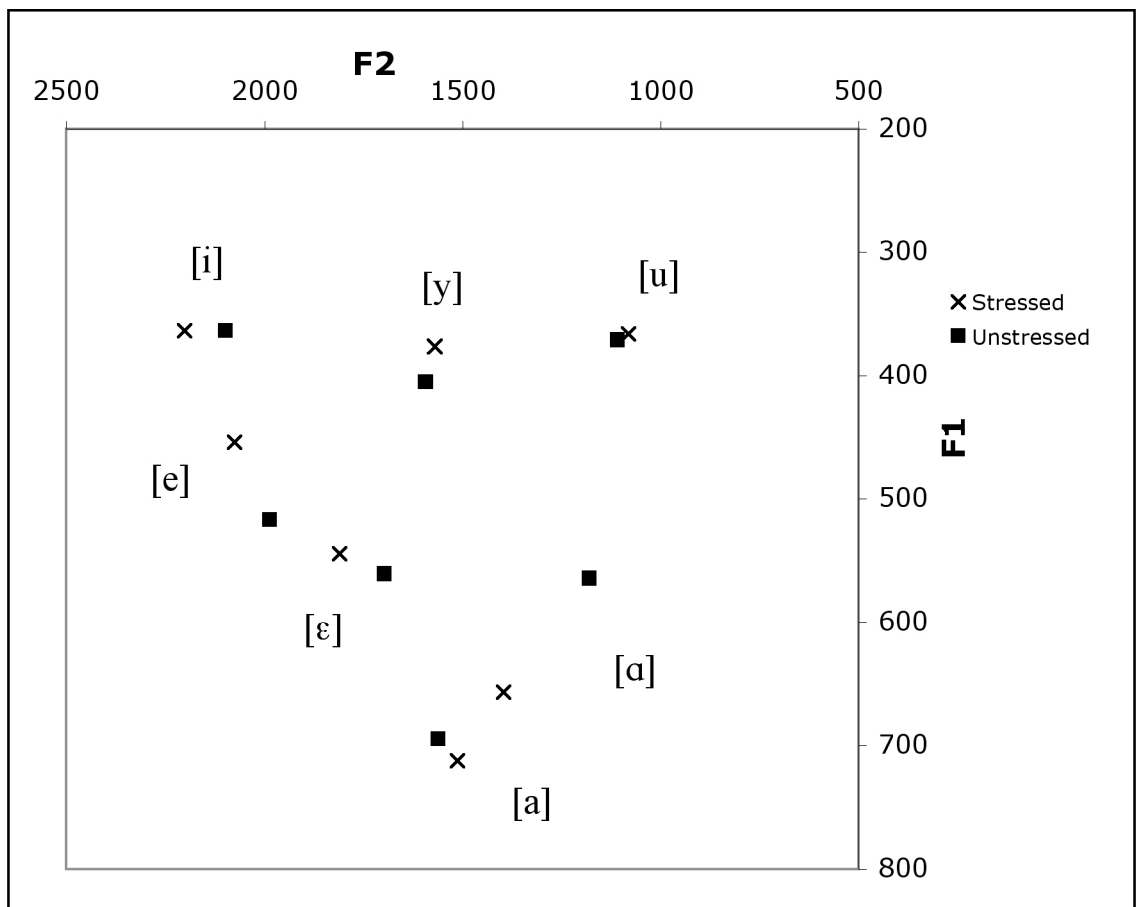
Table 10 and Figure 3 below present the average acoustic values obtained for each NF vowel at the midpoint of the steady-state in stressed and unstressed positions.

A comparison of the NF vowel triangles in stressed and in unstressed position in Figure 3 leads to the following observations. First, the shapes of the stressed vowel triangle and of the unstressed vowel triangle continue to resemble the traditional form documented for other varieties of French (Carton, 1974; Malmberg, 1963). Second, the ranges of these two triangles are similar to those of vowel triangles of other varieties of French (cf. Martin, 2002; Tubach, 1989), extending approximately 1100 Hz along the x-axis from [i] to [u] ( $F_2$ ) and 350 Hz along the y-axis from [i] to [a] ( $F_1$ ). It should be noted also that two vowels in particular, [e] and [ɑ], exhibit notably different values between stressed and unstressed position. This could be evidence of vowel centralisation, which is common in unstressed position.

**Table 10: Average Frequency Values (in Hz) for Seven NF Vowels: Stressed vs. Unstressed Position**

<i>Vowel</i>	<i>Stressed Position</i>		<i>Unstressed Position</i>		<i>Avg. Formant Frequency</i>		<i>Frequency Range</i>	
	<b>F<sub>1</sub></b>	<b>F<sub>2</sub></b>	<b>F<sub>1</sub></b>	<b>F<sub>2</sub></b>	<b>F<sub>1</sub></b>	<b>F<sub>2</sub></b>	<b>F<sub>1</sub></b>	<b>F<sub>2</sub></b>
[i]	364	2202	364	2098	364	2148	214; 643	777; 2740
[y]	377	1570	405	1592	391	1581	144; 584	735; 2229
[u]	367	1081	371	1109	369	1095	172; 589	564; 1706
[e]	454	2075	518	1987	486	2031	338; 769	1432; 2462
[ɛ]	545	1809	561	1695	553	1752	264; 1084	1109; 2327
[a]	706	1482	685	1537	696	1510	453; 977	699; 2110
[ɑ]	657	1396	565	1179	611	1289	455; 750	480; 589

**Figure 3: Vowel Triangles of the Seven NF Vowels: Stressed vs. Unstressed Position**



#### 4.2.3 The Effect of Syllable Structure on Vowel Formant Frequency

As outlined earlier, two criteria were considered important in vowel characterisation. This section will present the effect of the second factor, that of syllable structure.

Syllable structure is particularly interesting in the case of NF because of its importance in the determination of the presence of contextual variants. For instance, Walker (1984) notes that high vowels not lengthened by a consonant tend to open in closed stressed syllable in QF<sup>26</sup>, as in *pipe* [pɪp] vs. *pire* [piR],

<sup>26</sup> Note that Walker (1984) defines Canadian French (CF) as a French represented by the informal or colloquial speech of Montreal, i.e. QF (p. 4).



perhaps as a result of the physiological changes that occur in the articulation of syllable-closing consonants (Léon & Léon, 1997; Martin, 2002). If these variants are also found in NF, it is expected that the high vowels in closed syllables under study will have higher  $F_1$  formant values than the corresponding vowels in open syllables.

Table 11 and Figure 4 summarise and present the average frequency values for the seven NF vowels under study in open and in closed syllable as measured at the midpoint of the steady state (cf. Chapter 3 for more methodological details).

The comparison of the vowel triangles in Figure 4 leads to the following observations. First, syllable structure seems to affect all vowels, except [u]. This is particularly obvious in the case of [i] (326 Hz, 2192 Hz; 402 Hz, 2108 Hz) and [ɑ] (575 Hz, 1290 Hz; 676 Hz, 1215 Hz).

Second, according to the *Loi de position*, [e] cannot be found in closed syllable; therefore the only comparison that can be made is with [ɛ] in open syllable. The distinction between these vowels is primarily in  $F_2$  ([e] 2031 Hz ~ [ɛ] 1798 Hz). In open and closed syllable, [ɛ] can be distinguished in  $F_1$  and  $F_2$ .

Lastly, the productions of the two low vowels [a] and [ɑ] are clearly distinct according to syllable structure. While there is a 70 Hz separation in  $F_1$  between open and closed syllable for the low vowel [a], there is a 101 Hz difference between the two contexts for [ɑ].

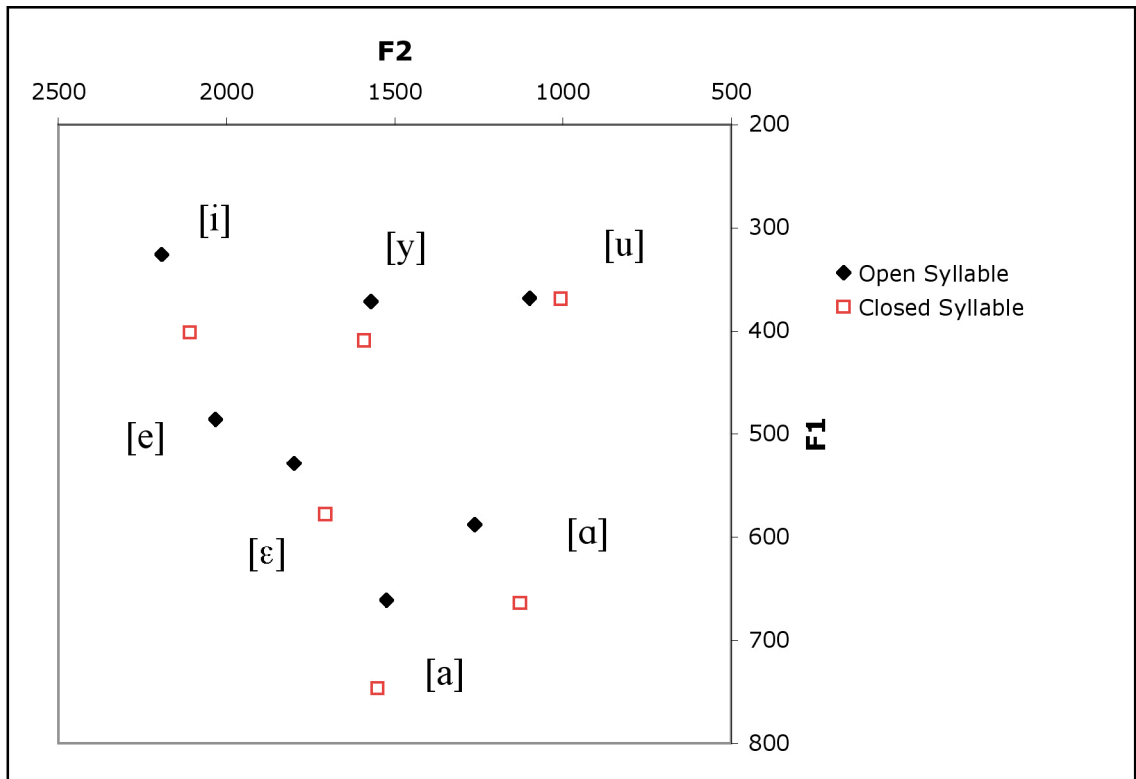
These observations will be discussed in greater detail in subsequent sections specifically regarding the high (Section 4.3), the mid unrounded (Section 4.4), and the low vowels (Section 4.5).

**Table 11:** Average Frequency Values (in Hz) for Seven NF Vowels: Open vs. Closed Syllable

<i>Vowel</i>	<i>Open Syllable</i>		<i>Closed Syllable</i>	
	<b>F<sub>1</sub></b>	<b>F<sub>2</sub></b>	<b>F<sub>1</sub></b>	<b>F<sub>2</sub></b>
<b>[i]</b>	326	2192	402	2108
<b>[y]</b>	372	1571	410	1591
<b>[u]</b>	369	1098	369	1007
<b>[e]</b>	486	2031	-	<sub>27</sub>
<b>[ɛ]</b>	528	1798	578	1706
<b>[a]</b>	666	1489	736	1530
<b>[ɑ]</b>	575	1290	663	1126

<sup>27</sup> According to the *Loi de position* the variant [e] is not found in closed syllable. The variants of the phoneme /E/ are in opposition only in open, stressed syllable.

**Figure 4: Vowel Triangles of the Seven NF Vowels: Open vs. Closed Syllable**



### 4.3 The High Vowels /i/, /y/, and /u/

In order to better describe and characterise the vowels of NF, the following section will examine the results of the current analysis for the high vowels /i/, /y/, and /u/. This section will present, in turn, the dispersion of the three high vowels, the effect of both stress and syllable structure on the formant values of the high vowels, and the possible effect of individual speaker variation. Finally, the average formant frequency results will then be compared to correlates in AF, in QF, and in HF. Recall that lax variants of the high vowels have been observed in the scientific literature (Brasseur, 2001; King, 1978; Thomas, 1977).

### 4.3.1 NF High Vowel Dispersion

Previously, in Section 4.2.1, the average formant frequencies and the dispersions of all tokens were briefly commented on in the current study. This section will investigate in greater detail the density, the boundaries, and the range of the high vowels [i], [y], and [u].

Figure 5 illustrates these characteristics of the high vowels' [i], [y], and [u] dispersion. First, the tokens of the high vowels [i] and [y] are relatively close together, with [i] having the densest concentration.

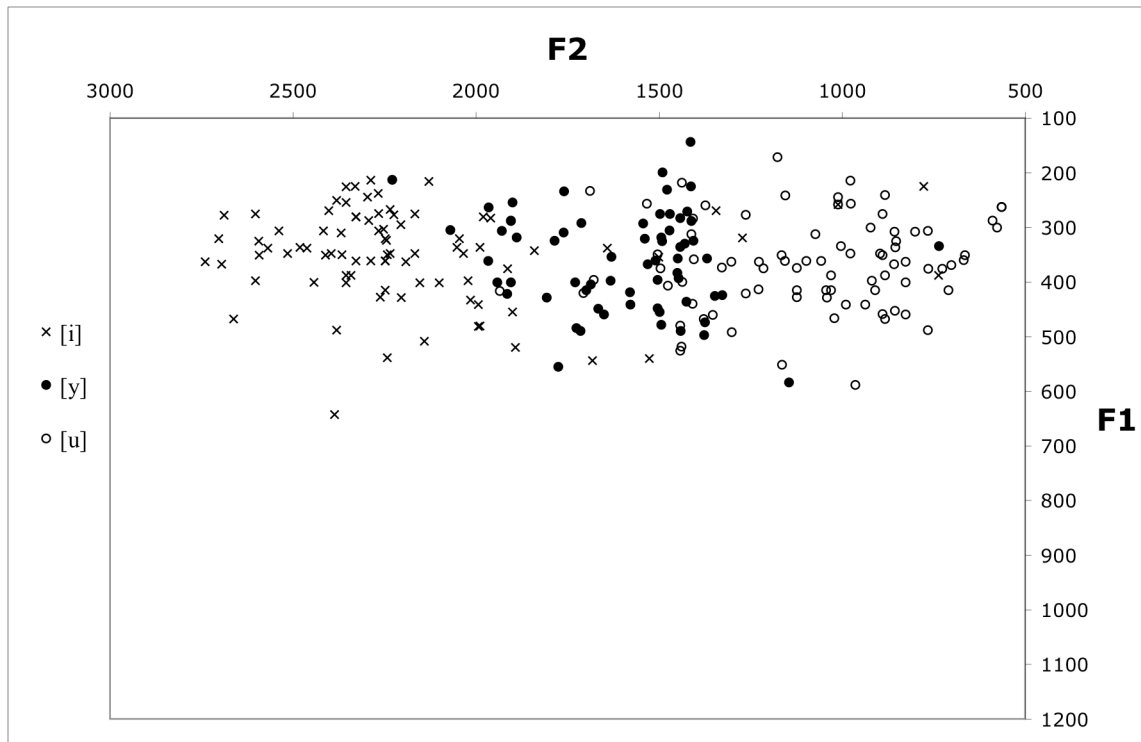
Second, the boundary between the high vowels [y] and [u] is relatively distinct, although there is a small amount of overlap. The boundaries visible in Figure 5 between [i] and [y] and between [y] and [u] are relatively close to the same boundaries measured by Rochet in his perceptual experiment:

approximately 2100 Hz and 1200 Hz (1995, p. 384). The large dispersion for [i] noted in Section 4.2.1 is confirmed in Figure 5, and as illustrated by two tokens found in the [u] region and several in the [y] region.

Third, and in particular, the high vowels show a large range of variation in  $F_1$  value, suggesting the existence of open variants [I], [Y] and [U] in NF. The average  $F_1$  value for [i] is 364 Hz, although there are a number of tokens found far from this frequency, as the range of  $F_1$  for [i] extends from 226 to 643 Hz, the largest of the three high vowels. In comparison, the average  $F_1$  value for [y] is 391 Hz, and the vowel has an  $F_1$  range extending from 276 to 490 Hz, while the average  $F_1$  value for [u] is 369 Hz, and the vowel has an  $F_1$  range extending from 214 to 551 Hz.

The possibility of open variants will continue to be considered further as the results for these vowels under the effect of stress and syllable structure are examined in the next two sections (4.3.2 and 4.3.3).

**Figure 5: Dispersion of all Tokens of the High Vowels**



#### 4.3.2 The Effect of Stress on NF High Vowel Formant Frequency

Following the observations presented in Table 10 and Figure 3 pertaining to the average formant values for NF vowels in stressed and unstressed positions, it can be observed that stress has little effect on the three high vowels; [i] presents a small variation in  $F_2$ , [y] shows a certain degree of distinction in  $F_1$ ,

and [u] presents virtually no distinction between stressed and unstressed position.

If allophonic variants for high vowels are found in the same environments as they are in QF, namely closed and stressed syllable, one would expect to see a greater  $F_1$  value for stressed [y]. However, Figure 5 shows the opposite result. In fact, the [y] in stressed position has a lower value (377 Hz) than in unstressed position (405 Hz). However, both values of [y] in NF are still noticeably higher than in HF (300 Hz), in QF (257 Hz), and in AF (280 Hz). Thus stress in itself does not seem to prove the presence of two variants for high vowels.

### **Individual Speaker Variation and the High Vowel [y]**

Each speaker's data were examined to determine if and how an individual speaker's results could influence those of the overall average (cf. Section 4.2.1), especially with regards to the high vowel [y], since this vowel, under the effect of stress, varies more than the others. For further reference, a table and figures summarising the stressed – unstressed results for each speaker can be found in Appendix C.

The high [y] does not show consistent patterning in all three NF speakers' productions. Contrary to S1 and S2, S3 displays a notable difference between stressed and unstressed [y]  $F_1$  values (3 Hz, 11 Hz, and 81 Hz respectively). In fact, S3 also produces this vowel with a lower  $F_2$  (1583 Hz, 1390 Hz), which locates this variant in a more centralised position. This value is also more centralised than those reported for the subjects in HF (Tubach, 1989), for QF

(Martin, 2002), and for AF (Lucci, 1972). This tendency could be indicative of vowel centralisation usually found in unstressed syllables.

The results of this section indicate that individual speaker variation may play a role in distinguishing vowels in stressed and unstressed positions. It is unclear at this point if this is the result of other factors affecting individual speakers or simply the idiosyncratic nature of speech. An investigation of the NF vowels under the effect of syllable structure may help determine more clearly if individual variation is indeed a factor to be considered in the current results.

#### 4.3.3 The Effect of Syllable Structure on NF High Vowel /u/

As outlined earlier, two criteria were established as factors under which vowels could be characterised. Because stress was not a decisive factor in the production of contextual variants for /u/, the second factor, that of syllable structure, will be considered. In particular, this section will discuss in greater detail the observation made in Section 4.2.3 (recall Table 11 and Figure 4) that syllable structure, demonstrated by an increase in  $F_1$  and in  $F_2$  from open to closed syllable, seems to affect all the high vowels, except /u/.

**Table 12: Formant Frequency Values (in Hz) for the High Back Vowel /u/ in Open and Closed Syllable, Stressed and Unstressed Position**

<i>Formant</i>	<i>Open Syllable</i>		<i>Closed Syllable</i>	
	<b>Stressed</b>	<b>Unstressed</b>	<b>Stressed</b>	<b>Unstressed</b>
<b>F<sub>1</sub></b>	368	369	366	373
<b>F<sub>2</sub></b>	1090	1105	1072	975

If /u/ behaved in a similar fashion to /i/ and /y/ in the current study, as well as to the high vowels of QF, then the effect of syllable structure should be evident and would be noticeable in  $F_1$  and  $F_2$  values of an open variant. However, this is not the case. The differences between stressed and unstressed in open syllable are minimal, as are the differences between the two in closed syllable. Still, when the comparison is made between tokens in closed stressed syllable and the other positions, which is the ideal environment for a lax variant of the high back vowel /u/, it must be admitted that the formant value differences are very small (as demonstrated in Table 12). As a result, this does not support the presence of contextual variants for this particular vowel.

#### **Individual Speaker Variation for /u/**

Since the average formant frequency results for syllable structure show little differentiation in values of  $F_1$  and of  $F_2$ , the data for syllable structure were re-examined in order to determine if an individual speaker's results may display a lax variant of the phoneme /u/. Such a variant would be found in closed syllable, according to the rule in QF (cf. Walker, 1984). Tables and Figures detailing the open-closed results for each speaker can be found in Appendix D.

The results of this re-analysis indicate that S2 and S3 do not demonstrate the expected more open variants of /u/ in closed syllable. In fact, differences in formant values of  $F_1$  and  $F_2$  are very small. For S1, on the other hand, the  $F_2$  difference is greater than that of the other two speakers. However, the results for S1 do not seem to support the presence of a lax variant since the distinction in



F<sub>1</sub> is minimal between open and closed syllable and the laxer variant is contrary to prediction.

#### 4.3.4 Comparison with the High Vowels of AF, of QF, and of HF

The second step in the current analysis, the comparison of NF, of HF, of QF, and of AF, is to ascertain the nature of the NF variety, as it has often been labelled simply as a variety of AF (Brasseur, 2001; King, 1978, 1982; Thomas, 1977). Table 13 summarises the F<sub>1</sub> and F<sub>2</sub> values, as well as those of F<sub>3</sub>, for the three high vowels of HF (Tubach, 1989), for QF (Martin, 2002), for AF (Lucci, 1972), and for those of NF obtained in the current study.

**Table 13: Formant Frequency Values (in Hz) for the High Vowels of HF, QF, AF and NF**

<i>Vowel</i>	<i>Formant</i>	<i>HF</i>	<i>QF</i>	<i>AF</i>	<i>NF</i>
[i]	F <sub>1</sub>	308	250	320	364
	F <sub>2</sub>	2064	2053	2000	2148
	F <sub>3</sub>	2876	-	2280	2928
[y]	F <sub>1</sub>	300	257	280	391
	F <sub>2</sub>	1750	1822	1520	1581
	F <sub>3</sub>	2120	-	2080	2418
[u]	F <sub>1</sub>	315	259	290	369
	F <sub>2</sub>	764	751	960	1095
	F <sub>3</sub>	2027	-	-	2473

The comparison of the data leads to two observations that distinguish NF, from HF, from QF, and from AF: 1) NF high vowels have higher values for F<sub>1</sub>, which suggests they are pronounced more open than the corresponding vowel in the other three varieties, and 2) the F<sub>2</sub> separation between [i] ~ [y] and [y] ~ [u] is similar (a difference of 567 Hz and a difference of 486 Hz respectively) in NF.

This is closer to what is found in AF, according to Lucci's (1972) data presented above, than it is to the traditional values in QF and HF.

Results for the high vowels of NF were examined in order to determine if stress, syllable structure, or individual speaker variation has any influence over the overall results of the current analysis. Of note is the more centralised position of [y], the presence of open variants for [i] and [y] but not [u] in the present corpus, and in comparison with correlates in HF, in QF, and in AF. Individual variation may play a distinctive role between formant values in stressed and unstressed position in the current corpus. As this section did for the high vowels, Section 4.4 will focus the current analysis on the two mid unrounded vowels of NF: /e/ and /ɛ/.

#### **4.4 The Mid Unrounded Vowels /e/ and /ɛ/**

In order to achieve the objectives of the current study, Section 4.4 will examine the results of the current analysis for the two mid unrounded vowels /e/ and /ɛ/. In particular, in order to meet the first objective, results for the effect of stress, the effect of syllable structure, and the possible effect of individual speaker variation on formant frequency results will be examined. Subsequently, the average formant frequency results will be compared to correlates in HF and in QF.

#### 4.4.1 NF Mid Unrounded Vowel Dispersion

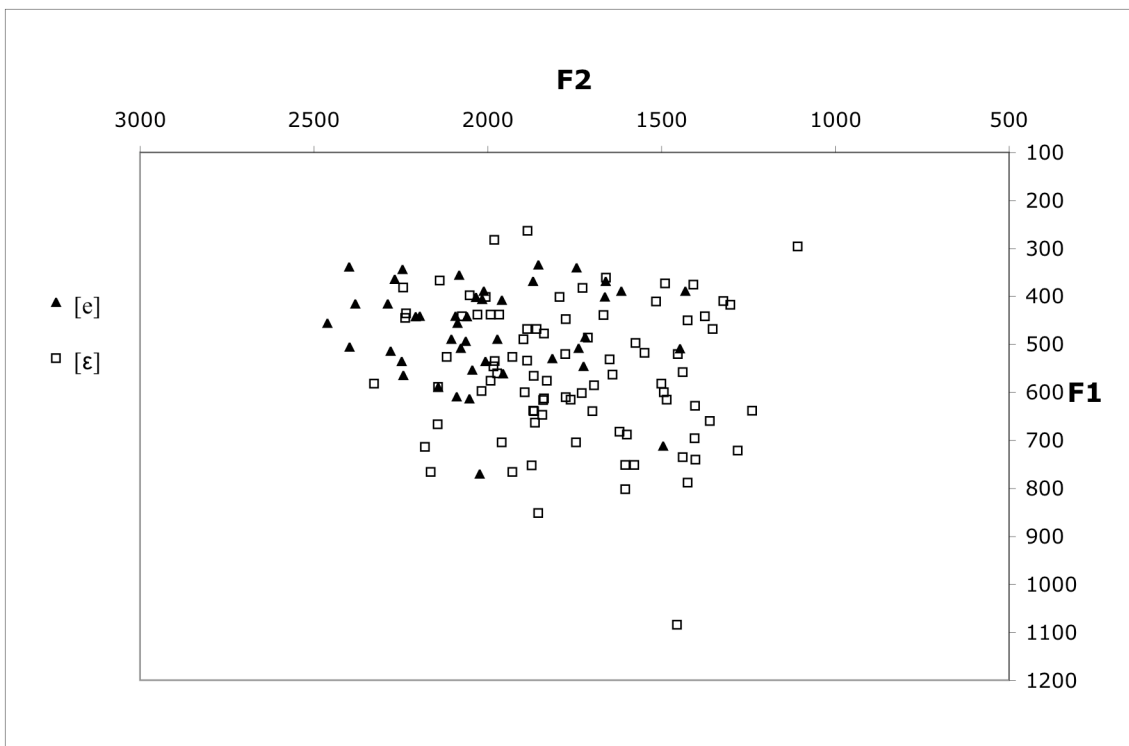
Section 4.2.1 examined the average formant values of NF in the current study and observations were made with regards to vowel triangle shape and range. This section will examine in greater detail three characteristics pertaining to the mid unrounded vowels realised as [e] and [ɛ].

Figure 6 illustrates the density, the boundaries, and the range of each of these vowels and suggests that these vowels show a noticeable overlap and little border distinction. There is denser representation and grouping of tokens of the mid front unrounded vowel variant [e] as compared to that of the tokens of [ɛ], which is somewhat spread out over the expected range of a French vowel triangle (on both the  $F_2$  and the  $F_1$  axes).

The complete vowel dispersion (Appendix B) also illustrates the widened range of the mid unrounded vowel [ɛ], because tokens of this vowel overlap with [i], [y], [e], [a] and even [ɑ]. The other mid unrounded vowel under study, [e], shares a large area with both [i] and [y].

The possibility of these contextual variants [e] and [ɛ] will be considered further as results for these vowels under the effect of stress and syllable structure are examined in the next two sections (4.4.2 and 4.4.3).

**Figure 6: Dispersion of all Tokens of the Mid Unrounded Vowels**



#### 4.4.2 The Effect of Stress on NF Mid Unrounded Vowel Formant Frequency

According to the *Loi de position* (cf. Section 2.3.2.1), in HF the open variant is found in stressed closed syllable and the closed variant is found in stressed open syllable (Léon, 1992). In QF, however, the opposition between /e/ ~ /ɛ/ is maintained in open syllable and is neutralised in closed syllable, where only the open variant is found (Dolbec et al., 2003; Martin, 1998). Although stress does not allow a distinction between [e] and [ɛ] in the *Loi de position*, it was deemed necessary to determine if it is indeed a distinguishing factor in NF. This section proposes to examine the possibility in NF of either two distinct mid

unrounded vowels or two contextual variants from an analysis of the effect of stress on formant frequency results.

Recall that Section 4.2.2 presented average formant values for NF vowels in stressed and unstressed position (and presented again in Table 14 for the mid unrounded vowels), which led to the observation that there is some degree of distinction in  $F_1$  in [e]. For example, between stressed (454 Hz) and unstressed (518 Hz) positions there was a 64 Hz difference in  $F_1$  whereas [ɛ] shows a 16 Hz difference in  $F_1$  between stressed and unstressed position.

**Table 14: Formant Frequency Values for the [e] and [ɛ] in Stressed and Unstressed Position**

<i>Vowel</i>	<i>Stressed Position</i>		<i>Unstressed Position</i>		<i>Avg. Formant Freq.</i>	
	<b>F<sub>1</sub></b>	<b>F<sub>2</sub></b>	<b>F<sub>1</sub></b>	<b>F<sub>2</sub></b>	<b>F<sub>1</sub></b>	<b>F<sub>2</sub></b>
<b>[e]</b>	454	2075	518	1987	486	2031
<b>[ɛ]</b>	545	1809	561	1695	553	1752

As can be observed in Figure 3, the mid unrounded vowel [e] in unstressed position has more of a tendency for modification than the [e] in stressed position or the mid unrounded vowel [ɛ] in either stressed or unstressed position.

Because of this slight variation, the effect of individual speaker variation on tokens of [e] formant frequencies will be examined in order to determine if individual speaker variation sheds some light on the question of contextual variants.

#### 4.4.3 Individual Speaker Variation and the Mid Unrounded Vowel [e]

Each speaker's data were examined to determine if and how an individual speaker's results could influence the formant frequency average for a vowel (cf. Section 4.2.1). This is an important point to consider in the analysis of possible contextual variants of the mid unrounded vowels.

The mid unrounded vowel [e] does not show consistent patterning in all three speakers' productions. This tendency can be observed primarily in  $F_1$ , and especially for S1, who has the most variation in range (401 to 769 Hz). In contrast, S3 also has most of his variation in  $F_2$  (1448 to 2462 Hz). Between accented and non-accented position, however, S3 continues to exhibit the most modification.

#### 4.4.4 The Effect of Syllable Structure on NF Mid Unrounded Vowel Formant Frequency

Syllable structure was identified as the second factor influencing vowel formant structure to determine the presence of contextual variants.

The orthoepic norm predicts that the mid unrounded vowel [e] will only be found in open syllable, whereas [ɛ] will be found in both open and closed syllable. Consequently, the orthoepic norm allows three predictions: 1) the mid unrounded vowel [e] will be found in open syllable, and the mid unrounded vowel [ɛ] will be found in closed syllable, in keeping with the *Loi de position*, 2) the graphic exceptions to the *Loi de position* found in stressed open syllable will be tokens of [ɛ], and 3) in open syllable there will consequently be a phonemic opposition of

phonemes [e]/[ɛ]. An examination of the corpus will seek empirical support for these predictions.

The first prediction would create a clear distinction between [e] and [ɛ] in open and closed syllables respectively. An assessment of the current corpus revealed that both of these mid unrounded vowels are found in open syllable (ex. *l'été, forêt*), and [ɛ] can also be found in closed syllable, in tokens such as *même* or *élection*. The average of the first and second formants in open syllable are clearly distinct from the ones in closed syllable: the F<sub>1</sub> and F<sub>2</sub> values for [e] in open syllable are 486 Hz and 2031 Hz, where in contrast the F<sub>1</sub> and F<sub>2</sub> values for [ɛ] in closed syllable are 578 Hz and 1706 Hz. These findings are outlined in Table 15.

**Table 15: Average Formant Frequency Values (in Hz) for the Mid Unrounded Vowels of NF**

Vowel	Open Syllable		Closed Syllable	
	F <sub>1</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>
[e]	486	2031	-	-
[ɛ]	528	1798	578	1706

The second prediction entails that [ɛ] is the variant that will be produced in words ending with the spelling *-et, ais, ait, aid, aient, aix*, such as in *ballet, jamais*, and *chantait* (Léon, 1992, p. 86). Exceptions to the *Loi de position* have been identified in the current corpus of NF in words such as *avait, mais*, and *billet* for S1, *projet, jamais*, and *parlait* for S2, and *chantait, contait*, and *lisait* for S3. As predicted, formant values for the 21 tokens of [ɛ] in open syllable (528 Hz, 1798 Hz) are realised in the vicinity of [ɛ] in closed syllable (578 Hz, 1706 Hz) as

well as remaining distinct from [e] in open syllable (486 Hz, 2031 Hz). In the current corpus, some tokens of [ɛ] in open syllable were observed to have  $F_1$  values noticeably greater than other tokens in the same position. The values were approaching values for [a], which suggests that another rule may in fact be in effect, that of the opening of [ɛ] in [a] (cf. Section 2.4.2.1; Walker, 1984), such as in the tokens *près* ( $F_1$  628 Hz,  $F_2$  1404 Hz) and *jamais* ( $F_1$  766 Hz,  $F_2$  1929 Hz).

An examination of the distribution of the mid unrounded vowels in open and then in closed syllable illustrates the extent of the vowel variation and the presence of outliers. The range of the mid unrounded vowels is wide, extending from 263 Hz to 852 Hz in  $F_1$  and 1109 to 2462 Hz in  $F_2$ . Recall that these sounds were labelled using the orthoepic norm and some speakers may have missed the target pronunciation: S1 has one outlier in open syllable (*enterrer*:  $F_1$  581 Hz,  $F_2$  2327 Hz) and one in closed syllable (*gouvernement*:  $F_1$  295 Hz,  $F_2$  1108 Hz), S2 has one in open syllable (*l'école*:  $F_1$  337 Hz,  $F_2$  2398 Hz), as does S3 (*chez*:  $F_1$  454 Hz,  $F_2$  2461 Hz).

#### 4.4.5 Comparison to the Mid Unrounded Vowels of HF and of QF

In the current study, ascertaining the nature of the NF variety commenced with the high vowels (Section 4.3.4) and will continue in this section with a comparison of the mid unrounded vowels of NF with those of HF and of QF. Note that mid unrounded vowels were not present in the AF corpus (Lucci 1969, 1972). Table 16 summarises the  $F_1$  and  $F_2$  values for the two mid unrounded



vowels /e/ and /ɛ/ of HF (Tubach, 1989), of QF (Martin, 2002), and of those of NF obtained in the current study.

**Table 16: Formant Frequency Values (in Hz) for the Mid Unrounded Vowels of HF, QF, and NF**

<i>Vowel</i>	<i>Formant</i>	<i>HF</i>	<i>QF</i>	<i>AF</i>	<i>NF</i>
[e]	<b>F<sub>1</sub></b>	365	349	-	486
	<b>F<sub>2</sub></b>	1961	2023	-	2031
	<b>F<sub>3</sub></b>	2644	-	-	2859
[ɛ]	<b>F<sub>1</sub></b>	530	461	-	553
	<b>F<sub>2</sub></b>	1718	1768	-	1752
	<b>F<sub>3</sub></b>	2558	-	-	2700

The comparison of the data leads to several observations that show a resemblance to or make a distinction between NF, HF, and QF: 1) the average values of NF mid unrounded vowels have higher values for F<sub>1</sub>, 2) the separation between F<sub>1</sub> values of [e] and [ɛ] is smaller than that of QF and of HF (F<sub>1</sub> difference of 112 Hz; F<sub>2</sub> difference of 255 Hz, and, F<sub>1</sub> difference of 165 Hz; F<sub>2</sub> difference of 243 Hz respectively), although the F<sub>2</sub> separation between the mid unrounded vowels is similar in these three varieties. This is consistent with the observation made in Section 4.2.1, that there is a downward shift in the NF vowel triangle as compared to the literature values provided for HF and for QF.

Results for the mid unrounded vowels of NF were examined in order to determine if stress, syllable structure, or individual variation had any influence on the overall average formant frequency results of the current analysis. The mid unrounded vowels showed noticeable overlap and little distinction in the

dispersion. However, with further analysis it was found that formant values for  $F_1$  are most affected by stress and that the data from the current analysis supports the *Loi de position*, with graphic exceptions. In comparison to QF and HF, the current corpus showed NF to have higher values for  $F_1$ , thereby confirming the downward shift in the NF vowel triangle compared to values in the literature for QF. As this section did for the mid unrounded vowels, Section 4.5 will focus the current analysis on the two low vowels of NF: /a/ and /ɑ/.

## **4.5 The Low Vowels /a/ and /ɑ/**

The present section will look at the results of the current formant frequency analysis for the low vowels /a/ and /ɑ/. In order to accomplish the first objective, this section will specifically look at the dispersion of the two low vowels of NF and the effect of both stress and syllable structure on their formant frequencies. Next, the average formant frequency values for the low vowels of NF will be compared to their correlates in HF and in QF.

### **4.5.1 NF Low Vowel Dispersion**

The average formant values for all tokens in the current analysis were examined in Section 4.2.1. This section will highlight the dispersion of the low vowels [a] and [ɑ].

Figure 7: Dispersion of all Tokens of the Low Vowels

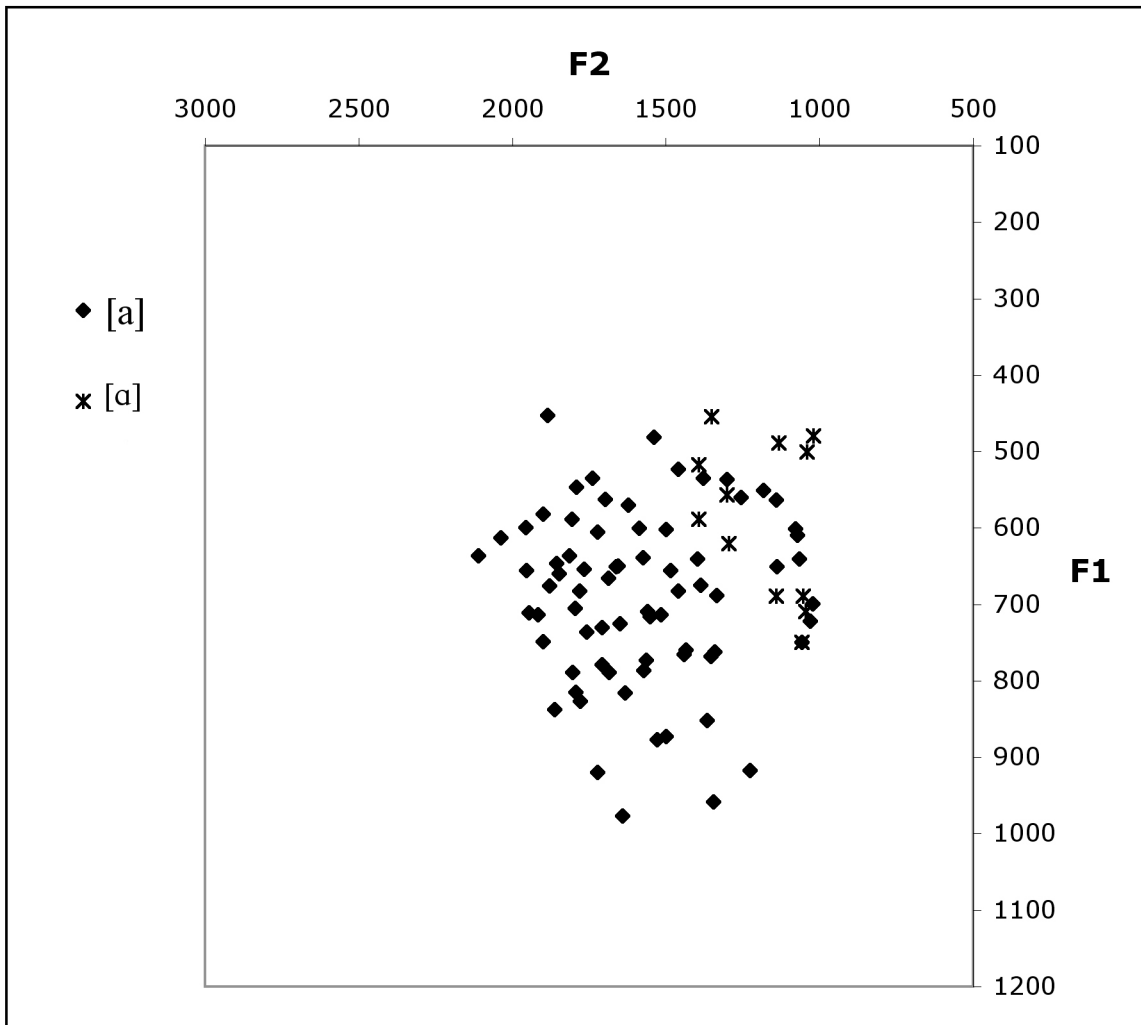


Figure 7 demonstrates that each of the low vowels has a relatively preferred area of dispersion. Although there is a greater variation in the tokens of [a], the low vowel [ɑ] appears to have a relatively compact dispersion almost contained within the frequency dispersion area used by [a]. The dispersion of low vowel tokens also indicates that there appear to be no clear boundaries between the two vowels. However, the average formant values are distinct ([a]: F<sub>1</sub> 696 Hz, F<sub>2</sub> 1509 Hz; [ɑ]: F<sub>1</sub> 611 Hz, F<sub>2</sub> 1288 Hz).

Of note, there are relatively few tokens for the posterior vowel, according to an initial orthoepic analysis (Table 17). However, the dispersion graph indicates that  $F_1$  and  $F_2$  vary noticeably for all the tokens identified as [ɑ]. This is characteristic of spontaneous speech and could account for individual differences in vowel pronunciation.

**Table 17: Orthoepically Determined Tokens of the Back Low Vowel [ɑ]**

<i>Speaker</i>	<i>Word</i>	$F_1$	$F_2$
S1	château	501	1040
	blâmer	689	1140
S2	pas	518	1393
	passe	489	1132
	rare	689	1052
	casser	480	1020
S3	pas	455	1351
	bas	589	1391
	âge	709	1044
	c <u>a</u> varois	557	1300
	casser	621	1294

Note: Where more than one [ɑ] could have been used, the chosen one is underlined.

#### 4.5.2 The Effect of Stress on NF Low Vowel Formant Frequency

Because Brasseur (2001) observed a maintained phonological opposition between /a/ ~ /ɑ/ in NF in final position ([bRɑ] *bras*), in non-final open syllable ([amare] *amarrer*), and in words with the spelling *-oi* in final syllable ([dwa] *doigt*), it was expected to find such examples in tokens of the current analysis. However, no tokens using the spelling *-oi* were found, and as a result the current study can

derive no conclusion with regards to Brasseur's (2001) observation that this spelling is pronounced with the back low vowel.

The current analysis (cf. Section 4.2.2) showed that the back low vowel [ɑ] shows more variation than the front low vowel [a] in association with stress. There is a 92 Hz difference in  $F_1$  between stressed and unstressed position (657 Hz, 565 Hz) and 217 Hz difference in  $F_2$  between environments for [ɑ] (1396 Hz, 1179 Hz), whereas these differences are 21 Hz and 55 Hz respectively for [a] ( $F_1$ : 706 Hz, 685 Hz;  $F_2$ : 1482 Hz, 1537 Hz).

It is noteworthy that two of the five tokens of the posterior vowel [ɑ] in unstressed position are example of words that have retained the etymologically-motivated back low vowel, as denoted by the *accent circonflexe* (ex. *château*:  $F_1$  501 Hz,  $F_2$  1040 Hz; *blâmer*:  $F_1$  689 Hz,  $F_2$  1140 Hz). In contrast, other orthoepically-classified tokens with [ɑ] in stressed position appear to be good candidates to become the front low vowel [a], as in HF. Examples of these include *pas* ( $F_1$  578 Hz,  $F_2$  1393 Hz), *bas* ( $F_1$  589 Hz,  $F_2$  1391 Hz), and *rare* ( $F_1$  689 Hz,  $F_2$  1052 Hz) (cf. Table 17).

For these reasons, an analysis of the effect of syllable structure on the formant frequency values of the low vowels would perhaps clarify the status of these two NF vowels.

### 4.5.3 The Effect of Syllable Structure on NF Low Vowel Formant Frequency

While stress did influence the production of formant frequency for the low vowel [a], it had little impact on the production of [ɑ]. Consequently, an examination of the influence of syllable structure would help to characterise these two vowels. Recall in Section 4.2.3 (Table 11 and Figure 4) that in different syllable structures the productions of the two low vowels [a] and [ɑ] are clearly distinct.

The variation in [ɑ] is greater than that of [a] between open and closed syllable.

Table 18 is a detail from Table 11 that illustrates the above point.

**Table 18: Average Formant Frequency Values (in Hz) for the Low Vowels of NF**

Vowel	Open Syllable		Closed Syllable	
	F <sub>1</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>
[a]	666	1489	736	1530
[ɑ]	575	1290	663	1126

The variation in F<sub>1</sub> of [a] may be the result of the backing of some tokens of this vowel to [ɑ]. This phenomenon is common in QF. The first of these possibilities is exemplified by the vowel [a] in the token *chialer*, categorised as anterior by orthoepic rules but considered and pronounced posterior by speakers of QF, where this word *chiâler* is frequently used. In the current study, this particular token was pronounced with an F<sub>1</sub> of 510 Hz and an F<sub>2</sub> of 1325, in the range of the posterior vowel [ɑ].

The second of the aforementioned possibilities stems from the following phonological rules: 1) the front low vowel [a] will undergo backing in open syllable (ex. chatte [fat]; chat [fɑ]), and 2) the front low vowel [a] will undergo backing before the lengthening consonant [R] (Walker, 1984). Examples from the current analysis that seem to follow these phonological rules include *Canada* [kanadɑ] (F<sub>1</sub> 523 Hz, F<sub>2</sub> 1439 Hz; F<sub>1</sub> 560 Hz, F<sub>2</sub> 1255 Hz), *déjà* [deʒɑ] (F<sub>1</sub> 551 Hz, F<sub>2</sub> 1183 Hz), and *dira* [diRɑ] (F<sub>1</sub> 641 Hz, F<sub>2</sub> 1065 Hz), as well as *plupart* [plypɑR] (F<sub>1</sub> 537 Hz, F<sub>2</sub> 1301 Hz), *arbre* [ɑRbR] (F<sub>1</sub> 564 Hz, F<sub>2</sub> 1140 Hz), and *parmi* [paRmi] (F<sub>1</sub> 609 Hz, F<sub>2</sub> 1071 Hz). As shown by the results of the current analysis, NF seems share these tendencies with QF.

Brasseur (2001) notes in his description of NF that [ɑ] is found in non-final open syllable. Actual examples of this phenomenon were found in the current corpus: *Acadienne* (F<sub>1</sub> 482 Hz, F<sub>2</sub> 1539 Hz), *j<sub>am</sub>ais* (F<sub>1</sub> 535 Hz, F<sub>2</sub> 1378 Hz), *caveau* (F<sub>1</sub> 601 Hz, F<sub>2</sub> 1077 Hz), and *rappelle* (F<sub>1</sub> 651 Hz, F<sub>2</sub> 1138 Hz).

The results of this section indicate 1) that syllable structure is a factor in the distinctiveness of the low vowels, and 2) that backing may explain the behaviour of some of the tokens of the low front vowel.

#### 4.5.4 Individual Speaker Variation and the Low Vowel [ɑ]

An analysis of the figure in Appendix B illustrating the vowel dispersion of all the tokens in the current study shows that the low vowel [ɑ] has a fairly dense and consistent patterning. However, it can also be observed that the number of

tokens for the low vowels [a] and [ɑ] is less than the number found for the high and the mid unrounded vowels. For this reason, tokens may affect the overall averages, as each token carries more weight in the calculation of the average.

The differentiation made by all three speakers between stressed and unstressed position was clear for the low back vowel [ɑ]. However, the differentiation made by S3 seems peculiar. S1 and S2 produced stressed [ɑ] with greater  $F_1$  than unstressed [ɑ], thereby locating the latter lower on their vowel charts. S3, on the other hand, produced stressed [ɑ] with greater  $F_2$  than unstressed [ɑ] which situates it very close to this speaker's [ɛ] dispersion. Three of the five tokens found in Table 17 illustrate this phenomenon: *pas* ( $F_1$  455 Hz,  $F_2$  1351 Hz), *bas* ( $F_1$  589 Hz,  $F_2$  1391 Hz), and *cavarois* ( $F_1$  557 Hz,  $F_2$  1300 Hz). There is little doubt that the low number of tokens for [ɑ], and other possible instances of idiosyncratic behaviour have an impact on overall average results.

The quantification and characterisation of the two low vowels of NF using the factors of stress, syllable structure, and individual speaker variation as differentiators suggest that although the low vowel [ɑ] has a denser token representation in dispersion, it has more distinction in formant frequency under the effect of both stress and syllable structure than [a], which is more affected by syllable structure. Individual variation on the number of tokens may play a role in the results of the current analysis. Remark that even two tokens of the same



vowel within the same word yielded similar values in the current analysis (ex. *Canada, pas*).

The last part of this section will present a comparison of the average formant frequency values for the low vowels of NF to their correlates in HF and in QF.

#### 4.5.5 Comparison to the Low Vowels of QF, and HF

In the ongoing analysis of the nature of the NF variety and its comparison to other varieties, this section will compare the current results for the two low vowels /a/ and /ɑ/ of NF to those of HF (Tubach, 1989) and QF (Martin, 2002).

Table 19 summarises the F<sub>1</sub> and F<sub>2</sub> values for the two low vowels of HF (Tubach, 1989), for QF (Martin, 2002), and for those of NF obtained in the current study.

Results for the low vowels /a/ and /ɑ/ were not present in the AF corpus (Lucci 1969, 1972).

**Table 19: Formant Frequency Values (in Hz) for the Low Vowels of HF, QF, and NF**

<i>Vowel</i>	<i>Formant</i>	<i>HF</i>	<i>QF</i>	<i>AF</i>	<i>NF</i>
[a]	F <sub>1</sub>	684	671	-	696
	F <sub>2</sub>	1256	1463	-	1510
	F <sub>3</sub>	2503	-	-	2642
[ɑ]	F <sub>1</sub>	-	607	-	611
	F <sub>2</sub>	-	1162	-	1288
	F <sub>3</sub>	-	-	-	2624

The comparison of the data leads to several observations that compare NF to HF and to QF: 1) the NF low vowel /a/ has remarkably similar F<sub>1</sub> values to

those of HF and to those of QF, and values of  $F_2$  in NF are similar to those of QF, and higher than those in HF, and 2) the NF low vowel /ɑ/ is pronounced very similarly to the corresponding vowel in QF, suggesting that the distinction between /a/ and /ɑ/ is maintained in NF as it is in QF; a closer look at the data also revealed that some of the tokens of [ɑ] could be the result of backing, as identified by Walker (1984), which is also found in QF. These observations suggest that although the low vowels of NF share some tendencies with HF and with QF, they have some unique characteristics meriting further investigation.

Results for the low vowels in NF were examined in order to determine if stress, syllable structure, or individual speaker variation had any effect on the average formant frequency values of the vowels calculated. The current corpus of NF shows the presence of two distinct low vowels, even though the back low vowel [ɑ] seems to be more influenced by stress and syllable structure than the front low vowel [a] in NF. Evidence of front low vowel backing was also found in NF, as is present in QF, either because of the vowel's position in final open syllable, or as a result of the lengthening consonant [R]. Also of note is the number of tokens found for the low vowels of NF in each of the speakers' recordings.

The following section will discuss the possible presence of diphthongs in the present corpus and in NF.

## 4.6 NF Diphthongs

As seen in Chapter 2, a diphthong is defined as a vowel that undergoes a single perceptual change in vowel quality over the course of its production within the same syllable (Crystal, 2003). Recall that diphthongisation is a common process in QF, whereas HF and AF do not exhibit this phenomenon.

Previously, in Section 2.3.2.2, it was noted that that in QF diphthongs are characteristic of the variety (Dolbec, *et al.*, 2003; Dumas, 1986; Walker, 1984). They are present in QF mostly in stressed position and in closed syllable, as in *arrive* [ariːv]<sup>28</sup>, *père* [pɛːr], and *pâte* [paːt] (Walker, 1984, p. 65). HF and AF, however, do not have any diphthongs (Le Clézio, 1989; Lucci, 1969, 1972; Motapanyane, 1997). In NF, the presence of diphthongs is a question of debate. While King (1978) has observed diphthongs in front of /R/ in closed syllable and as variants of /ɛ/, Brasseur (2001) has noted their paucity and has suggested that any diphthongs pronounced in NF may be due to the influence of QF (Section 2.3.2.2). The absence of diphthongs in the current corpus would, in part, support not only Brasseur's (2001) observations that diphthongs are not pronounced in NF, but also those assertions that NF is related to AF, since the lack of diphthongisation is a key characteristic of AF.

Both vowel length and vowel stress were considered in the current study's methodology, since both have been determined factors in diphthong production (see Chapter 3: Methodology for more information). Recall that King (1978)

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<sup>28</sup> Walker (1984) uses [r] to refer to [R].

observed diphthongs in the speech of younger speakers, but only a vowel lengthening ([ɛ:]) in the speech of older Franco-Newfoundlanders (cf. Chapter 2).

The corpus contained twenty-one vowels that were impressionistically identified by the researcher as possibly diphthongised. These vowels were found in closed, stressed syllable (as indicated by the word's spelling), the contexts for diphthongisation identified by Walker (1984).

Table 20 presents the twenty-one words with the alleged diphthongised vowels and their formant values. For the purpose of this analysis, a diphthong was identified as a function of  $t_3 - t_1$ , where  $t_3$  and  $t_1$  are functions of  $F_2$ . The differential calculation between  $t_3$  and  $t_1$  (Equation 1, Section 3.3.2.4) will be used to determine if the vowel is in fact diphthongised. Schouten and Peeters (2000) identified a minimum variation of 200 to 400 Hz for  $F_2$  as a threshold to the perception of a diphthongised vowel. This will be used as a reference in this study.

The variation in  $F_2$ , as shown in last column of Table 20, reveals that two tokens were clearly realised with a diphthongised vowel. These two words (*manière*, *cimetière*) imply the production of the mid unrounded vowel /ɛ/. In addition there are eight tokens that were realised with a variation in  $F_2$  of more than 200 but less than 400 Hz. According to Schouten and Peeters' (2000) criterion, these would have to be considered diphthongised mid and low vowels in the current corpus. However, such partial data would need to be confirmed with a more extensive analysis. If, in fact, diphthongs were present in NF, this

would weaken the argument that NF is related to AF, where the absence of diphthongs is a key characteristic.

**Table 20: Formant Frequency Values (in Hz) for Possible Diphthongs in NF: S1, S2, and S3**

<i>Speaker</i>	<i>Word</i>	<i>Vowel</i>	$F_2$ at $t_1$	$F_2$ at $t_3$	$\Delta F_2$	
<b>S1</b>	<i>première</i>	<i>/ɛ/</i>	2360	2014	-322	
	<i>manière</i>		2044	1525	-543	
	<i>père</i>		2082	1916	-233	
	<i>affaire</i>		1737	1817	91	
	<i>mauvaises</i>		2249	2065	-264	
		<i>tête</i>		1834	1730	-62
<b>S2</b>	<i>barre</i>	<i>/a/</i>	1060	1051	-88	
	<i>premières</i>	<i>/ɛ/</i>	1487	1389	-88	
	<i>manière</i>		1783	1422	-341	
	<i>derrière</i>		2214	2165	-288	
	<i>défaire</i>		1659	1866	216	
	<i>secondaire</i>		1807	1780	-102	
	<i>perdre</i>		1314	1052	-222	
	<i>française</i>		1697	1739	35	
	<i>anglaise</i>		2085	1924	-172	
	<i>crève</i>		1559	1567	97	
			<i>ancêtres</i>		1651	1786
		<i>l'héritage</i>	<i>/a/</i>	1801	1755	-2
<b>S3</b>	<i>misère</i>	<i>/ɛ/</i>	1986	1952	-260	
	<i>cimetière</i>		2365	1706	-700	
	<i>guerre</i>		2007	2050	-35	

## 4.7 Summary

The results presented in this chapter are measurements of three formant values of over four hundred tokens representing seven orthoepic vowels (/i, y, u, e, ε, a, ɑ/) of the French spoken in Newfoundland. These measurements were

taken from the spontaneous speech of three representative speakers of NF. The vowels were identified in four different environments (stressed and unstressed position, open and closed syllable) in order to evaluate the effect of both stress and syllable structure on the frequency at which the vowel formants were realised.

In comparison to the other three varieties of French examined in the current analysis, there is evidence that the high vowels of NF show evidence of laxing in closed stressed syllable. This corroborates the impressionistic observations of Thomas (1977), King (1978), and Brasseur (2001). The exception seems to be /u/, which shows no variant, perhaps due in part to speaker idiosyncratic nature. Furthermore, the distinction between the mid unrounded vowels seems to be maintained, a trend also found in QF. The data also suggest that the low vowels are also distinct and there is evidence of front low vowel backing in the current corpus of NF, as has been found in QF. Finally, this analysis has identified preliminary evidence to support the argument that, like QF, NF may be characterised by the presence of diphthongs. These results will be discussed further in Chapter 5.

## 5 DISCUSSION

### 5.1 Introduction

The objective of the present study was to describe and document the variety of French from Newfoundland by quantification and subsequent comparison to the varieties from Acadia, Quebec and France. Two questions initiated this research: How is NF characterised by its vowels? And, is NF really a variety of Acadian French as described by Thomas (1977), King (1978), King and Nadasdi (1987), Magord (1995) and Brasseur (2001)?

The results of this study seem to support some previous impressionistic observations made by Thomas (1977), King (1978) and Brasseur (2001), in particular the presence of more open variants of high vowels and the presence of contextual variation between the mid unrounded vowels and between the low vowels /a/ and /ɑ/. However, results with regards to the open variant [U] (for example) are inconclusive and either challenge the previous observations, or demand further investigation. The following section will discuss the results of this study, framed by the initially posed questions, followed by a more general discussion.

## **5.2 How do the Vowels Characterise the Variety of French Spoken in Newfoundland?**

Based on the results of the acoustic analysis of seven vowels from NF undertaken in this study it is possible to conclude that the NF vowel system contains open variants of the high vowels /i/ and /y/, maintains a clear distinction between the mid unrounded vowels, and makes the distinction between the two low vowels /a/ and /ɑ/. The possibility of diphthongs in NF has been noted in the current corpus. This section will discuss further the results obtained in Chapter 4, in particular the unexpected or unusual results obtained in the current study, in order to ascertain the character of the seven NL vowels studied.

### **5.2.1 An Acoustic Characterisation of the Vowels of NF**

The average formant frequency results of the current study can be summarised in the vowel triangle for NF (Table 21, Figure 8). From an examination of this vowel triangle it is possible to determine that it retains the expected shape for a variety of French.

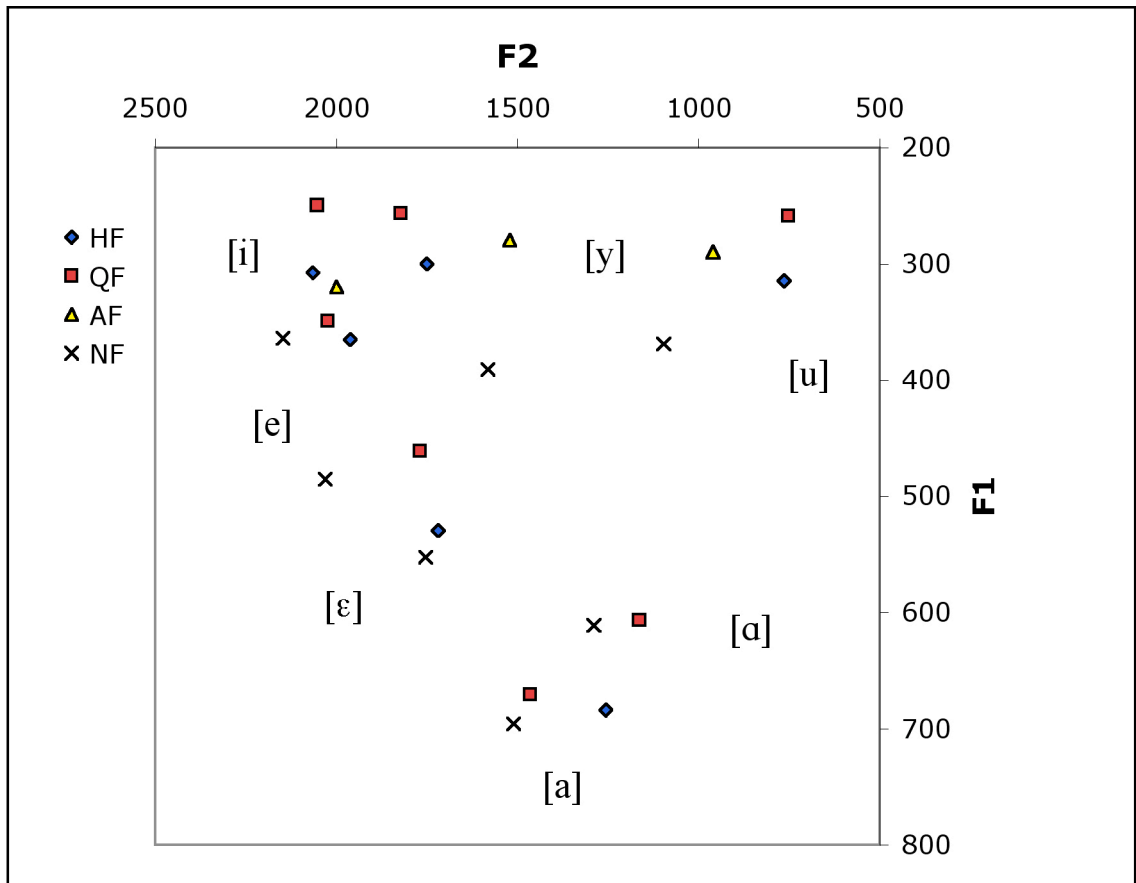
Of note, however, are the values of  $F_1$  for the high vowels. This could be either due to methodological considerations, as words were assigned to vowel categories based on the orthoepic norm, or due to the nature of spontaneous speech. The results of the current analysis have taken into account the open variant tokens within each of the high vowel groupings, which may account for their appearance of being more lax in NF in comparison to the other three varieties in Figure 8.



**Table 21: Formant Frequency Values (in Hz) for HF, QF, AF and NF**

<i>Vowel</i>	<i>Formant</i>	<i>HF</i>	<i>QF</i>	<i>AF</i>	<i>NF</i>
[i]	<b>F<sub>1</sub></b>	308	250	320	364
	<b>F<sub>2</sub></b>	2064	2053	2000	2148
	<b>F<sub>3</sub></b>	2876	-	2280	2928
[y]	<b>F<sub>1</sub></b>	300	257	280	391
	<b>F<sub>2</sub></b>	1750	1822	1520	1581
	<b>F<sub>3</sub></b>	2120	-	2080	2418
[u]	<b>F<sub>1</sub></b>	315	259	290	369
	<b>F<sub>2</sub></b>	764	751	960	1095
	<b>F<sub>3</sub></b>	2027	-	-	2473
[e]	<b>F<sub>1</sub></b>	365	349	-	486
	<b>F<sub>2</sub></b>	1961	2023	-	2031
	<b>F<sub>3</sub></b>	2644	-	-	2859
[ɛ]	<b>F<sub>1</sub></b>	530	461	-	553
	<b>F<sub>2</sub></b>	1718	1768	-	1752
	<b>F<sub>3</sub></b>	2558	-	-	2700
[a]	<b>F<sub>1</sub></b>	684	671	-	696
	<b>F<sub>2</sub></b>	1256	1463	-	1510
	<b>F<sub>3</sub></b>	2503	-	-	2642
[ɑ]	<b>F<sub>1</sub></b>	-	607	-	600
	<b>F<sub>2</sub></b>	-	1162	-	1233
	<b>F<sub>3</sub></b>	-	-	-	2601

**Figure 8: Vowel Triangles of HF, QF, AF and NF (values in Hz)**



The average formant frequency results confirm a distinction in the mid unrounded vowels and in the low vowels, as seen in Figure 8. These observations confirm impressionistic observations by Brasseur (2001), King (1978), and Thomas (1977).

### 5.2.2 The High Vowel /u/

The results of the current study indicate the presence of contextual variation by the existence of more open variants [ɪ] and [ʏ] of the high vowels /i/ and /y/ in NF. While [ɪ] appears under the influence of stress and mostly in closed syllable, [ʏ] seems to be more influenced by syllable structure (in closed syllable) than stress. This evidence supports the presence of allophonic variation and

confirms observations made by Thomas (1977), by King (1978), and by Brasseur (2001) who had noticed their occurrence in closed syllable.

The results for the high vowel /u/, however, indicate that this vowel does not follow the pattern established by /i/ and /y/. Furthermore, they do not support the presence of a contextual variant in closed stressed syllable, even though its existence has been noted in impressionistic observations made by Thomas (1977), by King (1978), and by Brasseur (2001).

Although one can always question the validity of the sample, it is reasonable to consider that with 84 tokens (more than for the other two high vowels) the presence of allophonic variation should have been observed in the current study. As a consequence, it is not evident that the current corpus need be put into question. Recall also from Chapter 4 that there was little individual variation noted for this vowel.

Another possible explanation may be revealed through the analysis of the behaviour of the high vowels' third formant ( $F_3$ ), a formant rarely studied in the scientific literature. Nevertheless, Debrock and Forrez (1976) suggests, in their mathematical analysis of French vowels, that  $F_3$  acts a reflection of vowel quality [although Ladefoged (1973) cautions that this auditory-acoustic correlation may not be so defined (p. 74)]. According to Delattre (1958),  $F_3$  can play an identification role in human speech, chiefly in the case of the high vowels, where  $F_2$  and  $F_3$  are close. It has been previously established that a decrease in  $F_3$  along with a decrease in  $F_2$  correlates, for example, with an increase in the degree of lip rounding (Delattre, 1958; Martin, 1998). As such, supplementary

spectral information provided by  $F_3$  has been used to distinguish between the high vowels [i] and [y] (Dubois *et al.*, 2001, p. 208; Martin, 1998). The aim of the current analysis of  $F_3$  is to determine if this formant can explain the behaviour of the high back vowel /u/, as an analysis of its  $F_1$  and  $F_2$  under the effect of stress and of syllable structure did not yield any indication of contextual variation.

**Table 22: Average Formant Frequency Results (in Hz) for /u/ with  $F_1$ ,  $F_2$ , and  $F_3$**

<i>Formant</i>	<i>open syllable</i>		<i>closed syllable</i>	
	stressed	unstressed	stressed	unstressed
$F_1$	368	369	366	373
$F_2$	1091	1105	1072	2344
$F_3$	2492	2475	2574	2344

Table 22 shows that  $F_3$  does not seem to act as a distinguishing factor for the high vowel [u] in different contexts. The data indicates variation between  $F_2$  and  $F_3$  in closed stressed syllable and open syllable, stressed and unstressed. In fact,  $F_3$  is remarkably similar, going only from 2574 HZ to 2492 Hz and 2475 Hz in these positions respectively. It was expected that a contextual variant would be made evident by analysing the data for  $F_3$ . As seen with these figures, the vowel /u/ does not seem to have a variant.

There are two possible explanations for these results; either there is no contextual variation in /u/ in NF, or the phoneme /u/ is realised as open variant [U]. Thus, other factors such as sentence prosodic structure may need to be taken into account.

### 5.2.3 The Diphthongs of NF

The results of this study may indicate the presence of diphthongs in the vowel system of NF. King (1978, 2005) noted their frequency in, for example, words borrowed from English, [a<sup>æ</sup>] in front of [R] in closed syllable, or as [ɛ<sup>j</sup>] or [ɛ<sup>l</sup>] in closed syllable. In contrast, Brasseur has previously noted their infrequency (2001). The current study analysed the difference between values of F<sub>2</sub> at two points along the length of the vowel, F<sub>2</sub>-shifting being an indication of vowel character change. The tokens analysed were those with vowels susceptible to diphthongisation in stressed position, as this is where they are found in QF.

Perceptually the results seem to indicate the presence of diphthongs. In particular, it is possible that they are context-specific, especially since the results indicate the presence of allophonic variation of the phoneme /E/, of which [ɛ<sup>j</sup>] and [ɛ<sup>l</sup>] may be a part. King (1978) does note this possibility, indicating that this tendency is present more so in the younger generations, possibly under the influence of QF (Brasseur, 2001), whereas the older generations tend to lengthen the vowel [ɛ:] in words such as *affaire* (King, 1978). This token was found in the corpus, along with tokens such as *père*, *cimetière*, *première* and *manière*. While some formant shifting within the range of perceptible diphthongisation calculated by Schouten and Peeters (1999) (200 to 400 Hz) was evident in tokens such as *cimetière*, tokens such as *première* and *manière* had larger changes in F<sub>2</sub> (700 Hz, 322 Hz and 543 Hz respectively), the token *affaire* itself had a small change in F<sub>2</sub> (80 Hz). One possible reason for the formant shifting of the first three

examples may be the consonant environment in which the vowel is found and not diphthongising of the vowel.

Consequently, according to Schouten and Peeters' (1999) criteria, diphthongised vowels may be present in NF. However, the present methodology is perhaps not enough to determine if indeed diphthongs are a key characteristic of NF, as the observations of Brasseur (2001) and King (1978) indicate. Therefore, a more detailed approach may be necessary, including the consideration of other factors such as consonant environment and vowel length.

#### **5.2.4 Speaker Age and the Effect of the Aging Voice on Formant Frequency**

Based on the results of the current analysis, it was found that the high vowels had greater  $F_1$  average values than in other varieties of French. Given that the speakers of the current study were older men, it was deemed necessary to investigate the possible effect of the aging voice on vowel formant frequency on the results of the current study.

Four studies in the scientific literature were examined. Linville and Rens (2001) determined that the pronunciation of vowels by an aged voice shows more centralisation of vowels. It has also been shown that only males show changes in vowel frequency characteristic of vowel centralisation (Rastatter & Jacques, 1990), due, most likely, to physiological changes of the vocal tract, such as the size of the pharyngeal cavity and the degree of tract opening, that alter the sonority of the speaker's voice (Balázs, 1994; Linville & Rens, 2001;

Liss, Weismer, & Rosenbek, 1990). As a result, values for  $F_1$  tend to be greater than those of younger subjects (Linville & Rens, 2001).

Age may therefore have partially influenced the  $F_1$  values for the high vowels of the current study. However, it is difficult to accurately quantify the effect of this factor; thus, further studies would be necessary in order to determine the extent of the effect of age on the voice of NF speakers.

The first question posed in the current study demanded the quantification and the characterisation of the seven NF vowels studied, the results of which were discussed in this section. The following section will discuss the character of the NF vowels studied in comparison to their correlates in HF, in QF, and in AF, so as to reflect on the second question that initiated the current study.

### **5.3 The Current Linguistic Situation – Is NF a variety of HF, of QF, or of AF?**

One of the goals of the current study was to characterise NF with regards to three other varieties of French that may or may not be closely related to it. The French from NF has been described as a variety of Acadian French (Thomas, 1977; King, 1978; King & Nadasdi, 1987; Magord, 1995; Brasseur, 2001). While this does not necessarily mean NF would be identical to AF, it does imply that NF would need to share many characteristics with AF.

The description of the seven vowels from NF under study took into account both syllable structure and the presence of stress in order to allow for proper comparisons with three other varieties of French that have been

documented in the scientific literature: HF, QF, and AF. These three other varieties were chosen based on their geographic proximity to Newfoundland and their historical links to the formation of the Francophone population in the province. The population of French on the west coast of the island of Newfoundland is a mix of Acadian and French from France and in particular from Brittany (*les Vieux Français*). The lexical influence of Mi'kmaq has been confirmed (cf. Chapter 2), but that of Breton is still disputed. However, there is no definitive support for the phonetic influences of the varieties of French spoken by the original Francophones in NF.

Due to the geographic and historical links between HF and NF, HF was chosen as one of the three varieties of French with which to compare NF. Even though the presence of variants of high vowels has been noted in certain varieties spoken in the north of France (Dumas, 1987), contextual variation of the high vowels does not seem to be a part of HF. The data suggests, that as with HF, NF also follows the orthoepic norm for the mid unrounded vowels, including the graphic exceptions mentioned in Chapters 2 and 4.

Variants of the high vowels are, however, a part of the vowel system of QF (Walker, 1984; Martin, 2002) and, as the results of this study seem to indicate, they are characteristic of NF as well. NF and QF also share the trait of adherence to the orthoepic norm in the case of the mid unrounded vowels. In addition, QF has prevalent opposition between low vowels /a/ and /ɑ/, including a backing of the front low vowel (Walker, 1984), a phenomenon found in the current corpus of



NF. Finally, NF also displays some diphthongised vowels, a trait it shares with QF.

As with QF and NF, variants of the high vowels are also a part of the vowel system of AF (Lucci, 1969, 1972). Lucci asserts that NF is like AF and HF in its treatment of the mid unrounded vowels, which is confirmed by the results of the current study. In AF, Lucci also notes that the opposition between low vowels /a/ and /ɑ/ is maintained only in closed syllable. However, in NF this opposition seems to be present in both open and closed syllables. In addition, Lucci states there is little diphthongisation in AF, a characteristic that, according to the current corpus, may not be shared with NF.

The results of the analysis show some shared characteristics with AF; these, however, are also found to be in common with QF and even with HF. Had NF evolved in complete isolation one would have expected the variety to be characterised by some distinguishing features. As a result, the data from the current analysis does not allow a clear answer to the above posed question. Although this was not the main objective of this study, it was still expected that this investigation would allow a clear statement to be made with regards to the character of NF and its relationship to these other dialects of French, and more specifically with regards to AF.

#### **5.4 A Sociolinguistic Characterisation of NF**

In addition to an acoustic analysis of vowel formants, a comprehensive assessment of NF should also include a sociolinguistic analysis of the variety status. The objective of this section is to characterise the linguistic “living

potential” (Fishman, 1990) of the variety of French from Newfoundland and in particular the variety spoken on the Port-au-Port peninsula of the Island of Newfoundland as it exists today. The scope of King’s analysis is not broad enough to include important social factors. Therefore, this section will first examine past research on the matter from the scientific literature, and, secondly, the linguistic vitality of NF through Fishman’s theoretical framework of Reversing Language Shift (RLS) (Fishman, 1990). Older studies have predicted a loss of the language, the people, and the culture. Of late, however, studies have implied a more positive outlook for the language variety.

In 1964, Stoker predicted language death for Newfoundland French. He based his hypothesis on the lack of use of the variety outside the home environment: “So we have French used purely for conversation in the homes, with School and Church, the two great formative institutes, using only English... practically all business is now carried out in English” (p. 351-352). He points out the deliberate decision by many parents to foster English at the expense of French, especially in the case of “mixed” marriages that favour the former and subordinate the latter. Stoker (1964) claims that French “is in the process of dying out and soon it will have disappeared” (p. 358). He reasons that because the language is rarely spoken or written it will disappear along with the older speakers. In 1964 high school students had lost the habit of speaking French, primarily due to the sense of inferiority and general indifference towards the language.

Stoker (1964, p. 358) concludes that it is “too late to arrest this process”, claiming that the French from Newfoundland have produced no tangible culture, no trace of folk songs or folk-tales or arts and crafts. Thomas quickly disproved this in 1977 with the publication of his work on the tall-tale in NF. Stoker (1964) adds that the “people of French origin feel they are wholly Newfoundlanders”, stating that this segment of the Newfoundland population voted almost 100% for confederation. In addition, Stoker (1964) states that the French from Newfoundland “feel no ties with either France or the province of Quebec”, with which Thomas (1977), Magord (1995, 1998) and Brasseur (2001) disagree.

In 1989, King predicted the obsolescence of the variety due to its limited practical application despite the existence of linguistic variation. She points to four characteristics typical of a language death situation present in the French population on the west coast of Newfoundland: 1) the use of the (socially) high variety in schools with minimal or no use of the (socially) low variety, 2) the restriction of the low-variety to certain domains, 3) the association of the high variety with high social status or socio-economic opportunity, and 4) the difference in low variety use between generations, with a greater use of the high variety by younger speakers. As a result, there is a decrease in “loyalty” towards the low variety.

Linguistic variation, King (1989) argues, may be “maintained in a dying language, in the absence of social differentiation, by fully fluent speakers of the language” (p140) if this variation does not carry the same weight of social meaning as in “healthier” speech communities. Variation, according to King

(1989), is present in morphological patterns such as clitic pronoun usage, specifically, younger speakers tend to cliticise object pronouns more, and number and case markings in the third person, with the younger speakers tending to generalise accusative and singular marking. King (1989) concludes that this trend in variation is without the classic social motivation since the population does not follow the Labovian social-differentiation pattern: “We would argue, then, that a great deal of variation remains in Newfoundland French, despite its decline in status, restriction in contexts of usage, and loss of speakers. However, this variation does not appear to carry the social meaning one finds in healthier speech communities. Variation in Newfoundland French is not particularly salient to its speakers, the great majority of which are illiterate in French” (p. 146).

In 1998, however, Magord studied the question of identity in a minority situation and predicted a revitalisation of the language. This movement of revitalisation is based on the redevelopment and transformation of the internal dynamic of the group, as seen in an increase in cultural activities and community involvement, including an increase in intergenerational and familial use of the language, in part stemming from the Canadian language policies of the 1970s and an increase in self-awareness. Factors advancing this dynamic include the move by the provincial government to transfer control of the school board and an increase in cooperation with other francophone groups on a national level.

According to Magord (1998), it remains to be seen what are the place and the validity of the identity and the language of the Newfoundland French

speakers over the course of the community redevelopment, economic and otherwise. The demographic and economic vitality of the three main Francophone communities is also a concern.

In order to characterise the linguistic vitality of Newfoundland French, Fishman's (1990) Reversing Language Shift (RLS) framework is applied to the current sociolinguistic situation present on the Port-au-Port peninsula of Newfoundland. The RLS framework encompasses the notion of a revival of social and cultural arrangements that foster stronger family and community bonds, where a traditional linguistic variety occupies a central unifying role. The RLS analysis is proposed as "an alternative planning theory in the sense that it attempts to bridge the gap between social science and societal reform" (p. 16).

Fishman presents eight post-ideological steps of RLS in reverse order. The first four steps (stages 8 – 5) detail RLS efforts at their earliest stages, the "program minimum of RLS" (Fishman, 1990, p. 22), while the last four steps (stages 4 – 1) outline a 'strong' and expectantly successful RLS effort, which thereby promote a lasting survival of the linguistic variety in question. Once these eight stages are attained, it is Fishman's assessment that language shift has occurred (Fishman, 1990, p. 16-17).

The following section will identify whether or not the RLS efforts related to the NF variety, as well as the francophone cultural values associated with its use, meet the criteria of each of Fishman's eight stages of RLS. In particular, while this researcher agrees with Magord's (1998) confident predictions for the continued survival of NF cultural values, this researcher believes the variety of

French specific to Newfoundland will be gradually replaced by a more standardised “Canadian” French. The following assessment will not only consider the vernacular French (NF) but also the use of a more standardised variety.

### **Stage 8: Linguistic Variety: Definition, Specification and Implementation**

Fishman’s eighth stage specifies the minimal effort level for successful RLS, which is the establishment of a definition of the linguistic variety in question, and code implementation. When examining the issue of Newfoundland French, it is possible to conclude that the requirements of this stage have been satisfied. Firstly, the NF variety has been the object of linguistic study. A written code for the variety was first established by Thomas (1977), and various linguistic aspects of the variety itself have been the subject of some linguistic study (Stoker, 1964; Sellers, 1976; King, 1978; Barter, 1986; Magord, 1995; Brasseur, 2001). Although some of these descriptions were limited, covering only one grammatical aspect of the language variety, others, like Brasseur (2001) are more comprehensive and even include an entire dictionary. While some researchers claim NF is an acadianised variety of French (King, 1989; King & Butler 2005), other researchers attribute more of a unique linguistic identity to the variety (Magord, 1995; Brasseur, 2001). It seems that NF has been defined in the scientific literature and does have a written code.

### **Stage 7: Traditional Intergenerational Cultural Events**

This stage in Fishman's RLS framework requires the existence of traditional cultural events across generations for the linguistic community in question. With regards to NF, it is apparent that the specific cultural values are transmitted through cultural events specific to the Port-au-Port region. These events include both the traditional NF 'fêtes', which are community-based festivals, and historical celebrations such as 'Le 14 juillet'. Remarkably, the Port-au-Port peninsula is the only region outside France to celebrate France's national holiday. Also noted are the active presences of francophone cultural associations, such as *L'Association Francophone*, based on the Port-au-Port peninsula. However, when examining the actual linguistic variety used during these events, it is not always not the variety of French commonly characterised as Newfoundland French, but rather more popularly a more standardised, Canadian French variety, with some coloring of the NF variety (certain lexical expressions or pronunciations). Thus, it is certain that the francophone population has a strong intergenerational cultural presence on the Port-au-Port peninsula although the variety of French used depends on the context.

### **Stage 6: Family, Neighbourhood, and Community-based Reinforcement**

This stage in Fishman's RLS framework specifies the family, neighborhood, and community-based reinforcement of the use of the target variety. As revealed in population statistics (Statistics Canada, 2001, 2006), there are no strictly monolingual speakers of the NF variety left, because of the

mandatory use of English in public schooling up until the 1970s, and the contact with the greater Anglophone population. French is still spoken in the home, and communication with the elderly or between elderly speakers in the informal register is conducted in the more traditional NF variety (Thomas, 1977; Magord, 1996). Otherwise, it is our experience that a more standardised variety of French is used in situations where French is spoken because of external influences, such as educational, media, and language policy. Therefore, it seems obvious that NF is used in family contexts and is reinforced in community-based communication even if sometimes it is a more standardised variety.

### **Stage 5: Formal Linguistic Socialisation**

The criteria of Fishman's stage 5 of RLS stipulate that NF must be incorporated into a variety of formalised linguistic contexts, including a degree of literacy in the target language. With respect to NF, community meetings do take place in French, and the NF community is served by at least one French newspaper (*Le Gaboteur*). Furthermore, formal linguistic socialisation also includes supplemented educational materials in French, which are used in Adult Education classes, developed under the Heritage Language Program (Magord, 1993). However, while the aim of these programs, services, and community-based initiatives may be to re-establish the French cultural and linguistic traditions of the Port-au-Port peninsula, because of the more formalised linguistic setting, the actual language used in these environments is again a more



standardised Canadian French variety, although the traditional NF francophone values are being transmitted.

By the time community RLS efforts attain this fourth stage, Fishman presumes a certain level of bilingualism, or rather, diglossia is achieved. Bilingualism is defined as referring to a similar linguistic capacity in two languages across contexts, whereas diglossia as the use of two languages in discrete linguistic contexts. These first four stages constitute what Fishman describes as the minimal program for reversing language shift, without which a variety has no chance of survival. As will be seen in the following sections, NF will satisfy more than the minimal requirement for language shift.

#### **Stage 4: Mandatory Formal Schooling**

This stage in Fishman's RLS framework requires the presence of mandatory formal schooling in the target variety. A renewed interest in NF by its speakers has manifested itself in an increased enrolment in Francophone programs starting in the 1970s. Federal and provincial governments set out to promote the traditional NF cultural values and the French language in the early 1990s (Department of Education, 2001). The inception of the *Conseil scolaire francophone* (Francophone school board) is another factor that contributes to the promotion and use of French in the school system. These programs aim to serve as a cultural centre for the NF community, while producing fluent French speakers who also master written French. Although the use of French in the community is strengthened by its expansion in the education system, the school

setting of teaching oral and written French precludes the use of the traditional NF variety, because of the paucity of teachers mastering the variety and the paucity of learning materials in that variety.

### **Stage 3: Worksphere Penetration, Influence, and Control**

Stage 3 in Fishman's RLS framework prescribes the use, the penetration, and the control of the target variety in the worksphere. Although data on this subject are not readily available, it is our impression that the NF variety enjoyed an exclusive use in the fishing and manufacturing industries up until the mid-twentieth century. Since then, these industries have been in a rapid decline, and combined with the aging population of native NF speakers, the result has been an attrition of the use of the NF variety in the worksphere. It is our impression that a less regionalised Canadian French variety is used in the educational and some governmental spheres, as well as in the previously-mentioned social contexts presented under other stages of the RLS process. This is to be corroborated by Magord's claims that French is now used in regional associations, school and community centres (1998, p. 148). Therefore, worksphere penetration may be a mix of the NF variety and a more standardised variety.

### **Stage 2: Lower Governmental Services and Local Mass Media**

This second-to-last stage in Fishman's RLS framework requires lower governmental services and local mass media to use NF. It is widely recognised

that governmental services are predominantly in English in order to cater to the vast majority of Newfoundland's population. However, the *Fédération des francophones de Terre-Neuve et Labrador* exists to defend and promote the rights and the interests of the Francophone and Acadian communities in Newfoundland, to the point of intervening in minority situations. Some community-level services are also provided in French: print media in French includes *Le Gaboteur*, which is published in Canadian French, with some popular NF lexical items and expressions; television media in French include French Television channels broadcast from Montreal, such as RDI; and radio media in French including a local Port-au-Port radio station (CBAF-16 Port-au-Port, CFPX), which broadcasts in a mixture of NF and Canadian French<sup>29</sup>. Although services in French are increasingly available, once again it is most likely a more standardised variety of French that is used.

### **Stage 1: Upper Governmental Operations**

The last stage of Fishman's RLS framework refers to the ultimate attainment of language vitality, meaning the availability of upper governmental operations in the target variety. In Newfoundland and Labrador, the use of French by high-level officials is sporadic at best, and may not appear in any official documentation. However, it is noteworthy that Sheila Copps' document upon the establishment of the *Conseil scolaire* was produced in both English and French (Department of Education, 2001). Even if this was an important step in

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<sup>29</sup> CBC Radio-Canada had French language programming based in Corner Brook until March 2009, when it was cancelled due to CBC budget cutbacks.

the right direction, including more documents being produced in French, it seems reasonable to assume that NF would not be visible in written form. Furthermore, English would most likely be the language of choice for official meetings and informal communication (ex. memos, emails) within the provincial government. This, however, is not a goal of NF use, as it is a regional linguistic variety of a very small minority of Newfoundland's population.

Through an analysis of NF using the framework of Fishman's eight stages of RLS, it would seem that the NF variety has limited potential for long-term linguistic survival. In most of the RLS stages, while NF cultural values may play a central role, the language used almost exclusively is a more standardised Canadian French variety. Furthermore, with the current cultural and linguistic revitalisation efforts, it is possible to hypothesise that NF cultural values and the use of a standardised French do have the potential to survive in a larger context of the preservation of *Francophonie*. However, these larger Francophone issues clearly factor into the vitality of the NF linguistic variety, specifically the use of a more standardised French, which is gradually supplanting the use of the more traditional NF variety.

## **5.5 Directions for Future Research**

The main objectives of this study were to complement the existing scientific literature by providing empirical data on the NF vowel system. The present study has provided acoustic quantification of seven of the vowels from the variety. The results of this study indicate the presence of more open variants of /i/ and /y/, the possibility of mid unrounded vowel (/e/ and /ɛ/) contextual

variation, and the distinction of both of the low vowels /a/ and /ɑ/ primarily through the influence of syllable structure.

This study has also provided a means of comparison to other varieties of French. In particular, the results indicate that NF does share characteristics with HF, with QF and with AF but that NF is also unique in its vowel system nature. Yet the comparison of the results of the present study to those in the scientific literature has been somewhat limited due to the small amount of methodological information available in these studies. In future research one would have to consider such criteria as the gender and the geographic origin of the speakers of the varieties being compared, as these can possibly influence results and question comparisons. Nevertheless, the complete examination of the NF variety is beyond the scope of this study, and, as a consequence, this variety merits further objective acoustic investigation.

This research could provide empirical data to which future in-depth studies of the complete vowel system, with an increased number of speakers and tokens, including vowel-length studies for the study of diphthongs, could be compared. Furthermore, as Brasseur (2001) states, the language is in evolution and an investigation including sociolinguistic components would help to determine if the French currently spoken in Newfoundland by the new generations of speakers has modified. The degree of modification could come as a result of either an evolution in the variety since the introduction of media sources, or its contact with English. Such research could answer sociolinguistic

questions such as: How do Newfoundlanders perceive their French? Do they have an “ideal” or “target” French? What is the future of the NF variety?

Whereas acoustic data from the current study has provided an initial quantification, perceptual correlates to the production data could corroborate these findings. The analysis of these properties would help determine if speakers of NF perceive characteristics of the variety of French particular to the west coast of the province as their own, or like AF, QF or HF. If subjects were able to identify the vowels as tokens of NF, this would support a claim for the existence of a unique variety of French in Newfoundland.

In conclusion, while acoustic measurements of certain vowel traits confirm previous observations made in the scientific literature, some of the results challenge the notion that NF is a variety of Acadian French. Further research, including studies into the full vowel and consonant systems of NF, the lexicological and morpho-syntactic particularities unique to the variety, and the prosodic nature of the variety could help clarify the issues raised in the present study.

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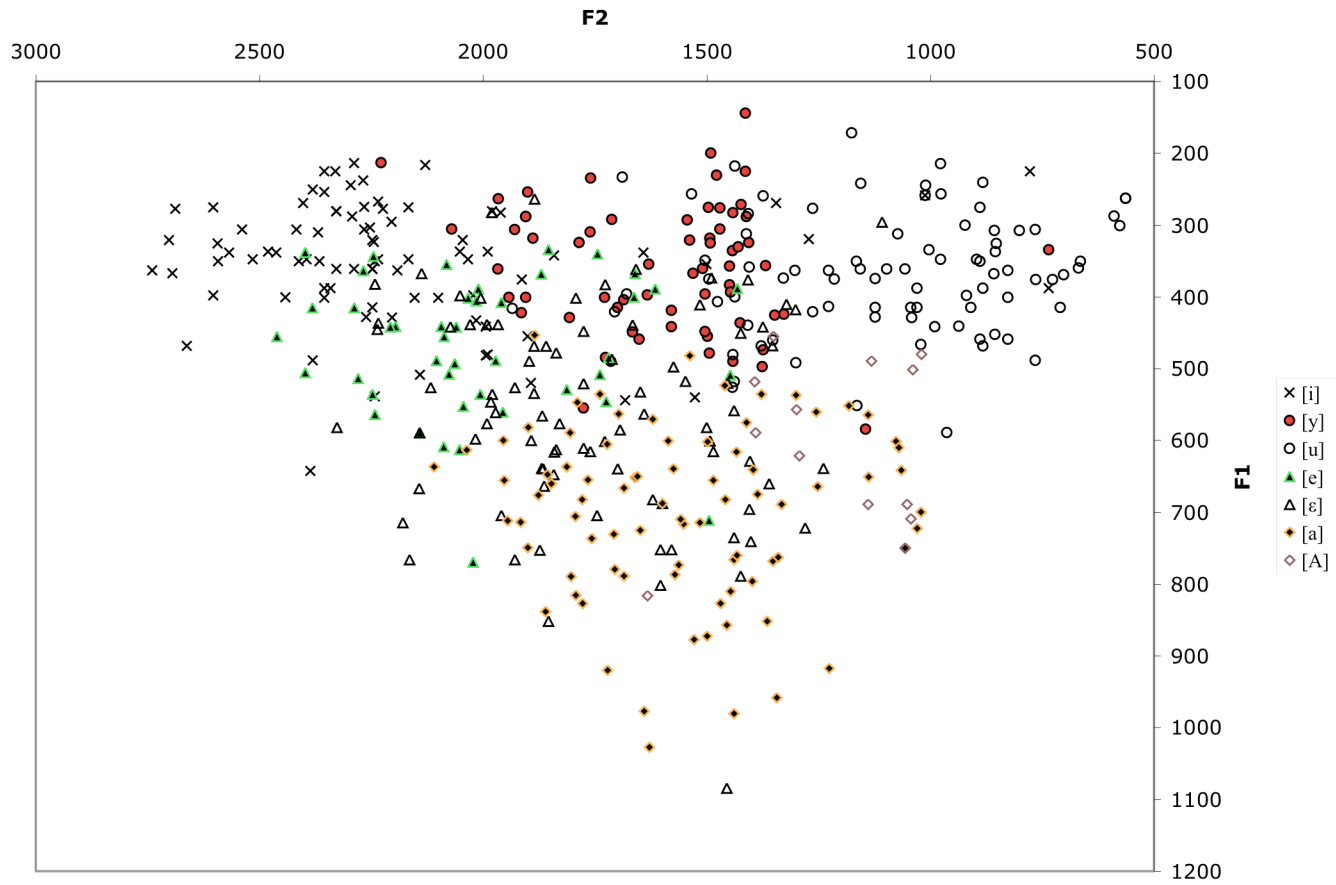
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## **APPENDICES**

**Appendix A: Average Formant Values and Formant Value Ranges for the Seven Vowels of NF in the Current Study, Divided by Speaker**

<i>Vowel</i>	<i>Speaker</i>	<i>F<sub>1</sub></i>	<i>F<sub>2</sub></i>	<i>F<sub>3</sub></i>
[i]	S1	352.50	2350.25	2971.25
	S2	370.25	1950.00	2813.50
	S3	367.50	2150.25	2996.75
	<b>Avg.</b>	<b>364.00</b>	<b>2148.42</b>	<b>2927.83</b>
	<b>Range of Var.</b>	<b>9.97</b>	<b>200.15</b>	<b>99.97</b>
[y]	S1	392.00	1664.00	2324.25
	S2	326.50	1593.00	2497.00
	S3	453.50	1486.00	2431.25
	<b>Avg.</b>	<b>390.68</b>	<b>1581.00</b>	<b>2417.50</b>
	<b>Range of Var.</b>	<b>63.53</b>	<b>89.60</b>	<b>87.19</b>
[u]	S1	366.00	977.75	2550.25
	S2	325.00	1106.25	2432.50
	S3	415.50	1200.25	2437.00
	<b>Avg.</b>	<b>368.83</b>	<b>1094.75</b>	<b>2473.25</b>
	<b>Range of Var.</b>	<b>45.32</b>	<b>111.69</b>	<b>66.72</b>
[e]	S1	545.50	2033.50	2934.00
	S2	415.50	1950.00	2726.50
	S3	497.00	2109.00	2917.00
	<b>Avg.</b>	<b>486.00</b>	<b>2030.83</b>	<b>2859.17</b>
	<b>Range of Var.</b>	<b>65.69</b>	<b>79.53</b>	<b>115.21</b>
[ɛ]	S1	659.75	1731.50	2677.25
	S2	495.50	1743.50	2684.00
	S3	504.00	1781.75	2740.00
	<b>Avg.</b>	<b>553.08</b>	<b>1752.25</b>	<b>2700.42</b>
	<b>Range of Var.</b>	<b>92.47</b>	<b>26.24</b>	<b>34.45</b>
[a]	S1	765.00	1520.75	2641.5
	S2	643.25	1506.75	2632.75
	S3	679.00	1500.25	2650.50
	<b>Avg.</b>	<b>695.75</b>	<b>1509.25</b>	<b>2641.58</b>
	<b>Range of Var.</b>	<b>121.75</b>	<b>20.50</b>	<b>17.75</b>
[ɑ]	S1	725.00	1283.00	2837.00
	S2	522.00	1106.00	2385.00
	S3	586.00	1474.00	2650.00
	<b>Avg.</b>	<b>611.00</b>	<b>1287.67</b>	<b>2624.00</b>
	<b>Range of Var.</b>	<b>203.00</b>	<b>369.00</b>	<b>452.00</b>

## Appendix B: Vowel Dispersion for All Tokens in the Current Study



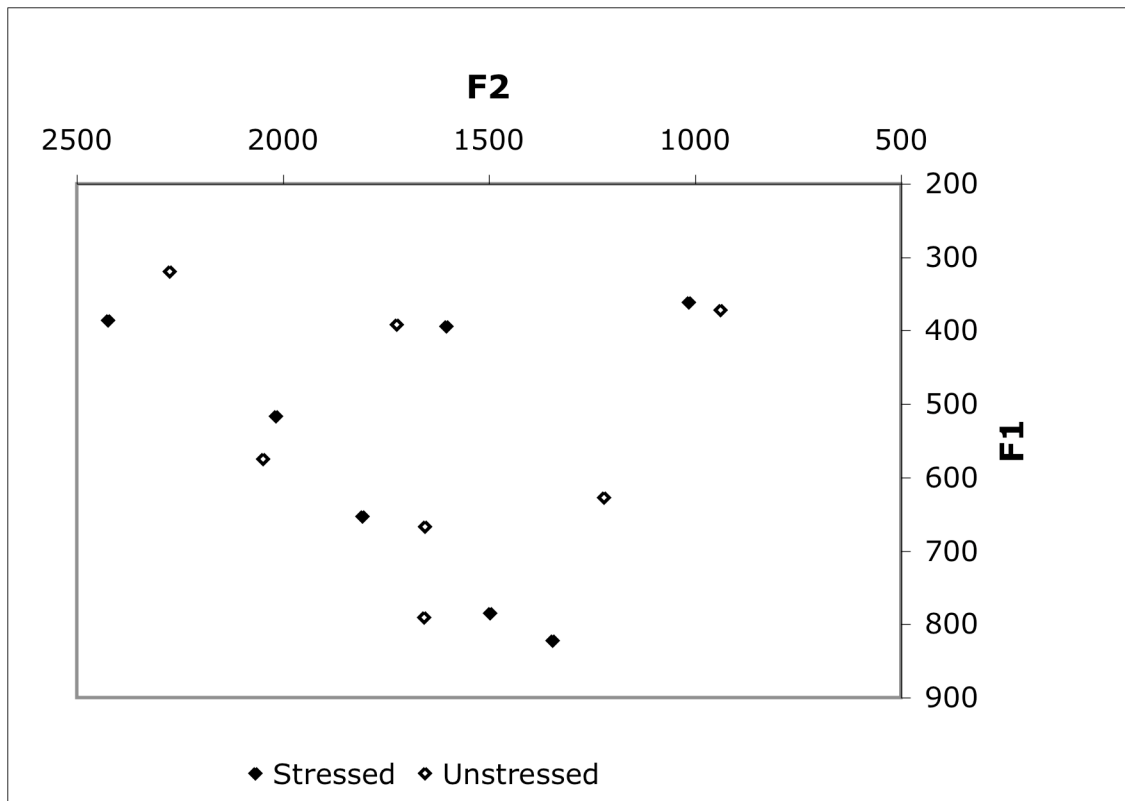


**Appendix C: Formant Frequency Values (in Hz) for Each Speaker in Stressed and Unstressed Position**

*Formant Frequency Values (in Hz) for S1: Stressed vs. Unstressed Position*

Vowel	Stressed Position		Unstressed Position	
	F <sub>1</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>
[i]	386	2425	320	2276
[y]	394	1604	391	1724
[u]	361	1017	372	939
[e]	516	2018	575	2049
[ɛ]	653	1808	667	1656
[a]	768	1457	763	1585
[ɑ]	822	1346	627	1221

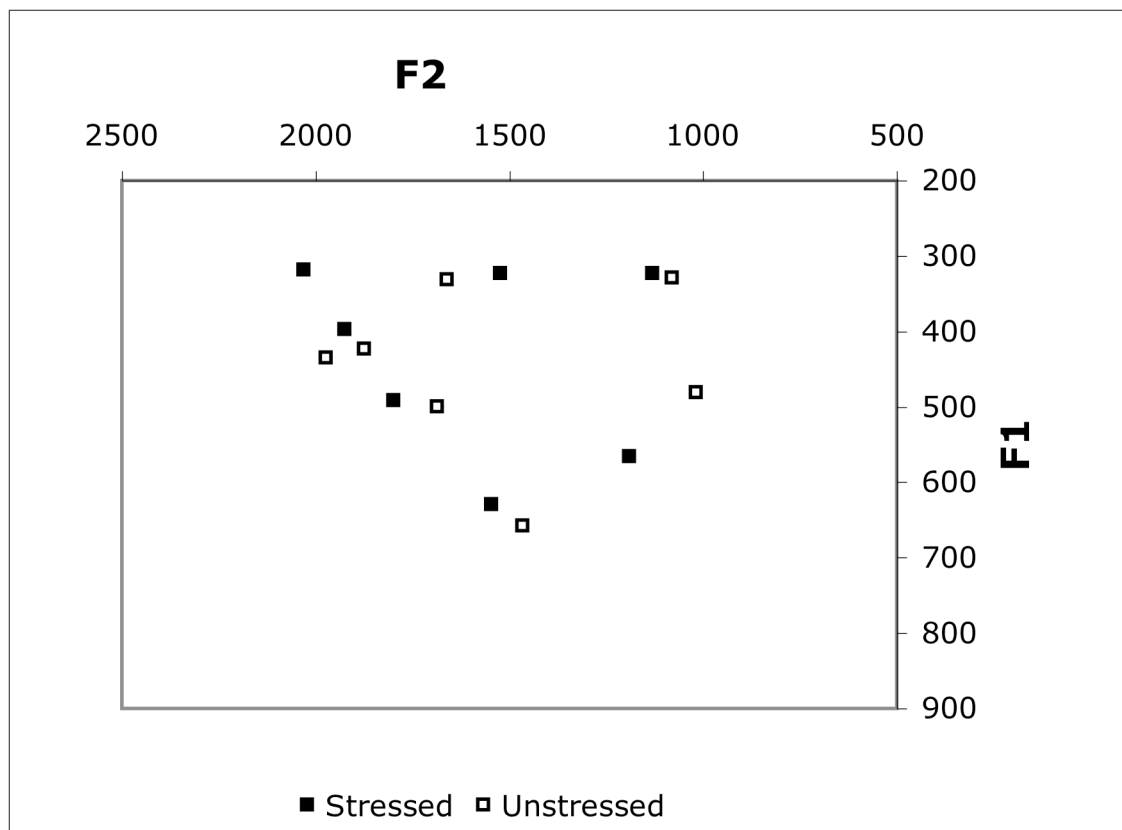
*Vowel Triangles for S1: Stressed vs. Unstressed Position (values in Hz)*



*Formant Frequency Values (in Hz) for S2: Stressed vs. Unstressed Position*

Vowel	Stressed Position		Unstressed Position	
	F <sub>1</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>
[i]	318	2033	423	1877
[y]	323	1524	331	1662
[u]	322	1133	328	1080
[e]	397	1926	434	1974
[ɛ]	492	1799	500	1688
[a]	629	1546	658	1468
[ɑ]	565	1192	480	1020

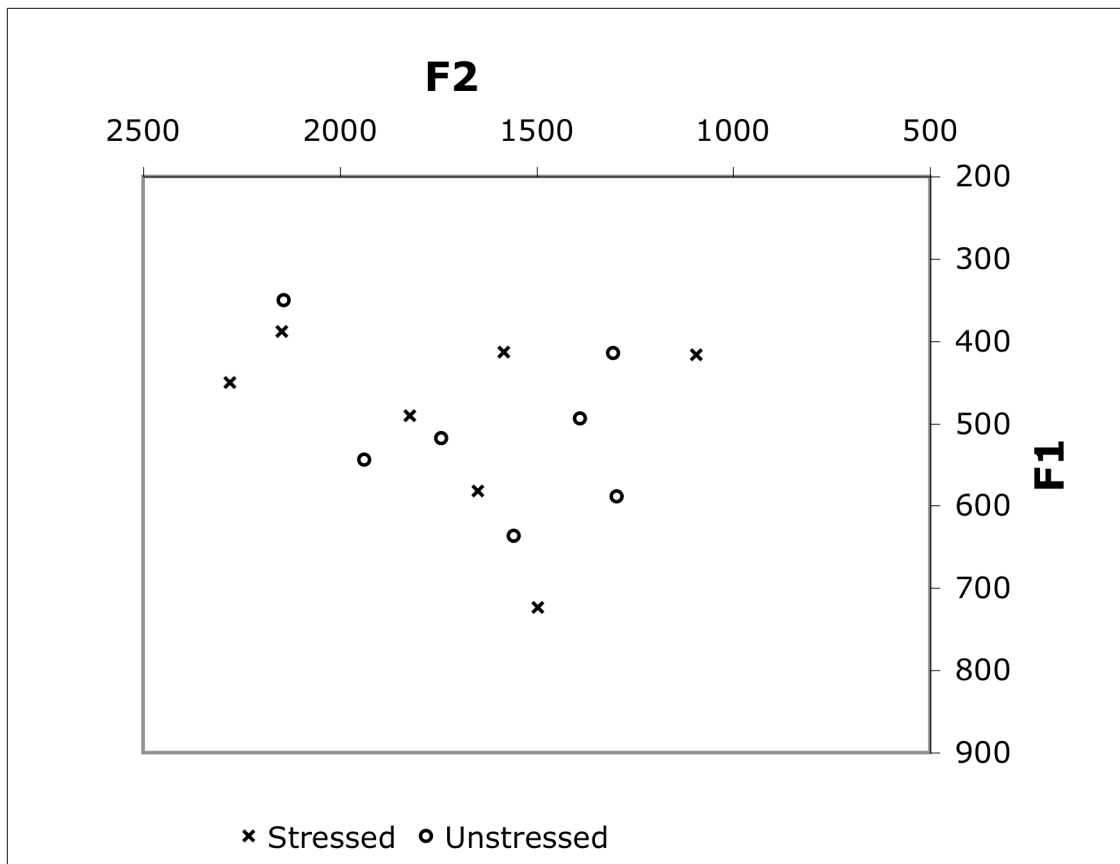
*Vowel Triangles for S2: Stressed vs. Unstressed Position (values in Hz)*



*Formant Frequency Values (in Hz) for S3: Stressed vs. Unstressed Position*

Vowel	Stressed Position		Unstressed Position	
	F <sub>1</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>
[i]	388	2148	351	2142
[y]	413	1583	494	1390
[u]	417	1094	414	1307
[e]	450	2280	544	1938
[ɛ]	491	1821	518	1743
[a]	722	1442	637	1559
[ɑ]	582	1650	589	1297

*Vowel Triangles for S3: Stressed vs. Unstressed Position (values in Hz)*

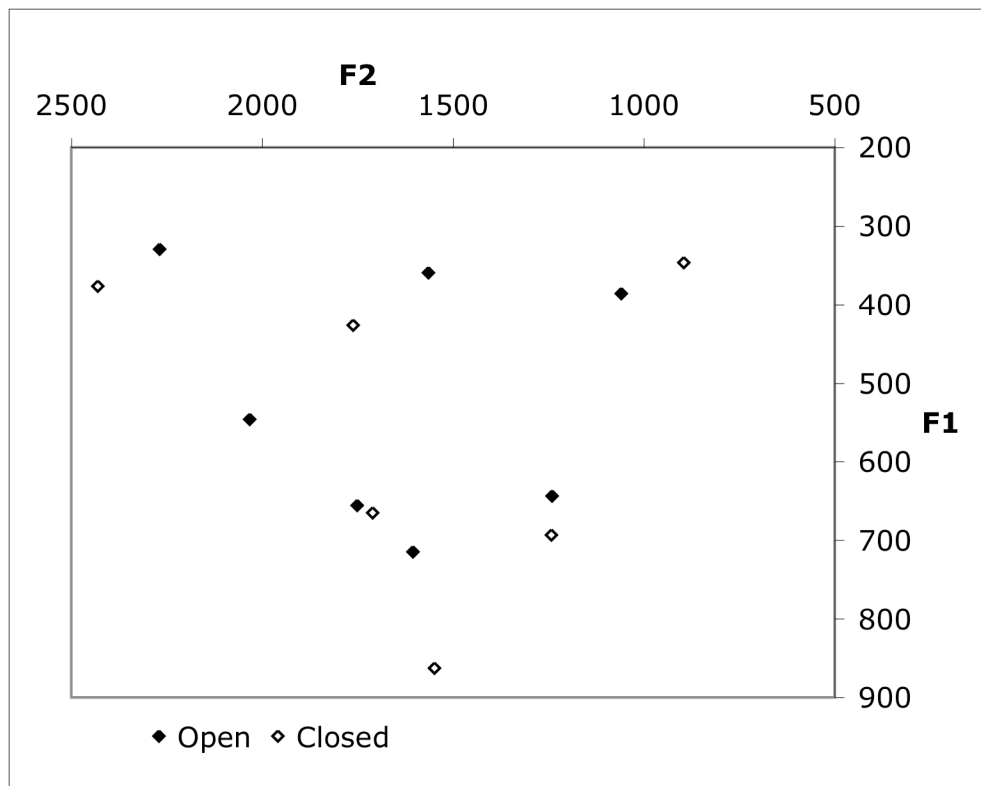


## Appendix D: Formant Frequency Values (in Hz) for Each Speaker in Open and Closed Syllable

*Formant Frequency Values (in Hz) for S1: Open vs. Closed Syllable*

Vowel	Open Syllable		Closed Syllable	
	F <sub>1</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>
[i]	329	2270	376	2431
[y]	359	1566	426	1763
[u]	386	1059	346	897
[e]	546	2034	-	-
[ɛ]	655	1751	665	1712
[a]	714	1606	862	1550
[ɑ]	643	1241	693	1243

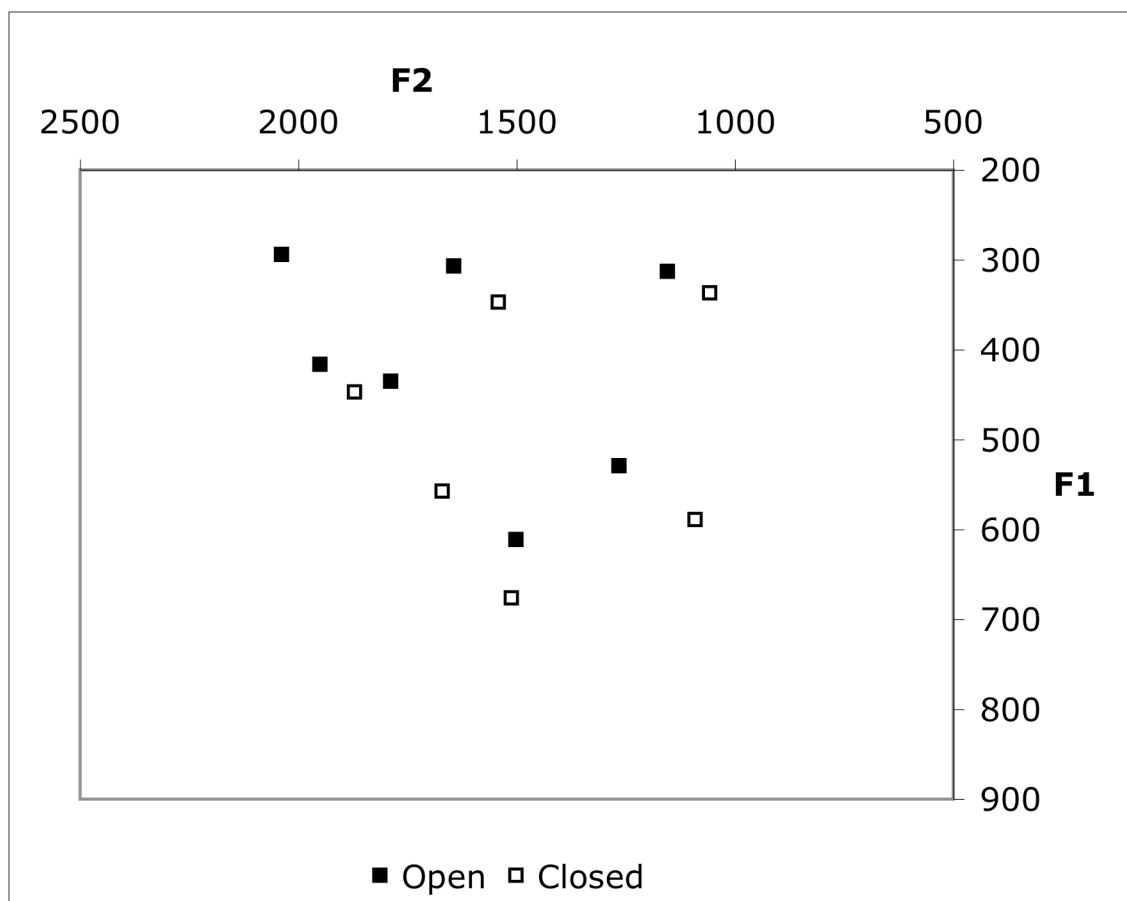
*Vowel Triangles for S1: Open vs. Closed Syllable (values in Hz)*



*Formant Frequency Values (in Hz) for S2: Open vs. Closed Syllable*

Vowel	Open Syllable		Closed Syllable	
	F <sub>1</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>
[i]	294	2038	447	1871
[y]	307	1644	347	1543
[u]	313	1155	337	1058
[e]	416	1950	-	-
[ɛ]	435	1788	557	1670
[a]	611	1501	676	1513
[ɑ]	529	1266	589	1092

*Vowel Triangles for S2: Open vs. Closed Syllable (values in Hz)*



*Formant Frequency Values (in Hz) for S3: Open vs. Closed Syllable*

Vowel	Open Syllable		Closed Syllable	
	F <sub>1</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>
[i]	357	2269	382	2021
[y]	449	1505	458	1467
[u]	407	1080	425	1065
[e]	497	2109	-	-
[ɛ]	496	1857	512	1707
[a]	658	1464	702	1591
[ɑ]	620	1276	709	1044

*Vowel Triangles for S3: Open vs. Closed Syllable (values in Hz)*

