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Some effects of the phonological background on EFL phonetic production, among students of LLCER M2

Nedjem Eddine Larbaoui

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LARBAOUI
Nedjem eddine

Sous la direction de Mme Laure GARDELLE
Membres du jury : Mme Laurence DURROUX

UFR de langues étrangères
Département langues, littératures et civilisations
étrangères et régionales (LLCER)

Mémoire de master 2 recherche - 30 crédits
Parcours : Études anglophones orientation recherche
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Introduction

English has become one of the most widely spread languages in the world, with 360 million native speakers, and from 470 million to over 1 billion non-native speakers. To illustrate, Crystal (2003, p. 10) argued that, non-native speakers outnumbered native speakers by a ratio of 3 to 1. Furthermore; considering its predominance as a language of technology, science, mathematics and a plethora of other fields, it has often been referred to as a "world language" or the lingua franca of the modern era. As a result, learners from all around the world show great interest in this language, as it paves the way to new life opportunities, be it work, travels, business etc...This overwhelming Preponderance of English as a second language, makes it inevitably come in contact with the languages of the world. This clash manifests as a multitude of linguistic phenomena that are studied in the field of comparative linguistics, among which is "sound transfer", and it will be the focus of the present dissertation

In applied linguistics, *transfer* is the effect of one's native language on the acquisition of a target language. This can take place in all language areas: pragmatics, rhetoric, semantics, syntax, morphology, phonology, orthography, and phonetics (Odlin, 2003). This dissertation fall into the field of phonetics, and attempts to study the possible transfer of a learner's native phonetic knowledge into their second language performance, because "acquisition of the exact accent of a foreign language seems to be difficult and often remains impaired after proficiency in other levels of vocabulary has been achieved" (Ioup, 1984)

According to the latest research records, transfer can be both negative and positive depending on the learner's L1 and L2, Bardovi-Harlig (2017) states that: "In the area of phonetics and phonology, negative transfer effects account for much (although perhaps not all) of typical foreign accents. Target language sounds or sound combinations that do not occur in the native language typically cause special problems for learners". This effect is noticeable during one's first contact with the EFL learner, as it has a direct impact on their way of speaking, more specifically, their pronunciation. To exemplify, Loup (1984) came to the conclusion that L2 accent is more readily detectable at the level of phonology than at the level of syntax. However, French and English are Indo-European languages, which share a common history and a large number of cognates. This proximity could be a facilitating agent for learners as they would find themselves confronted to linguistic segments they are familiar with, which should generate varying amounts of positive transfer, which may be defined as the instances "when the influence of the native language leads to immediate or rapid

acquisition or use of the target language....” (Bardovi-Harlig, 2017) Conversely, French and English can also be considered deceptively similar on the morphological level, yet possess unique sound systems. Consequently this relationship makes for a curious case that attracts my personal interest. This Master’s dissertation will explore some of the effects of the French phonological background on the EFL phonetic performance of a group of M2 LLCER Students, to shed some light on the phenomenon of sound transfer and its effects on the language performance of advanced learners, whose native language is French, to see if, and more importantly how, their production of sounds is influenced by their phonological background.

The questions that this dissertation will attempt to answer are as follows: to what extent does the French phonological background affect the production of English phonemes and their distribution, among M2 LLCER students in reading exercises? What part of this impact can we consider as fossilisation? Does the French phonological have a positive or negative effect on the pronunciation of M2 LLCER students?

Throughout the years of second language acquisition (SLA) research, countless experiments on L2 pronunciation have been conducted on learners who hail from various linguistic backgrounds and who belong to different age groups, however most of the linguists that conducted pronunciation experiments (Gathercole, Hitch, Service and Martin, 1997; Gathercole, Frankish, Pickering and Peaker, 1999) focused on beginner or intermediate level learners, mainly because it is in these phases of the L2 learning process that the impact of the L1 is most pronounced. However, what is not studied as extensively are the effects of phonological transfer on advanced learners, because “it is clear that negative transfer and other inhibiting factors play a minimal role if any in the pronunciation of such highly proficient learners.” (Odlin, 2003, p. 468)

This dissertation aims at contributing to the field of phonetics and phonology by considering the possibility that one’s L1 has a lingering effect on their production of their L2. This is one of the reasons why the experiment invited six students with advanced English training who are enrolled in M2 LLCER. Three of them have spent at least 1 year in an English speaking country. The other reasons for this choice are: (1) The participants are classmates of the author of this dissertation which eliminated any problems of distance and accessibility, because they have shown readiness to provide authentic data (2) They have been learning English for at least 8 years and are doing an English major, which makes them advanced learners (3) They were keen on improving their pronunciation. In this regard, this

study employed Received Pronunciation as a native reference for the comparative analysis. RP English is defined as "the standard accent of English as spoken in the south of England" (Pearsall (1999, p.14), alternatively, it is known as Southern British English (Jack Windsor Lewis 1972). And although it is spoken by 10% of the population of England, (Wells, 1982), RP remains the standard variety used by phoneticians to this day¹. As a result, the assistance of two native speakers of this variety was requested to serve as samples for comparison.

Due to the limitations of this dissertation, the number of participants was restricted to six. Unfortunately such a sum of data could not possibly provide valid scientific evidence but should be able to present provisional data. The study is therefore divided into two chapters; the first chapter comes in two parts. The first presents a brief review of literature on the theory of cross linguistic influence in general, and on sound transfer in particular. The second part will perform a modest phonological comparison between an assortment of English phonemes, and their French equivalents, in an attempt to predict the difficulties or the facilitations they may induce.

The second chapter is based on a practical approach, as it consists of a case study of a group of LLCER M2 students. The first section will present the methodology of the development of the experiment, starting with the parameters of the experiment, and the text that was presented to the students, then the tools that were used to manage and analyse the data. The second part of the chapter contains the first observations of the experiment, as well as the statistical results to see if they have matched our predictions or not, in order to verify the extent by which the French phonological background impacts the production and the distribution of English sounds among advanced EFL learners.

¹ See chapter 2 methodology, 4.1.1. Language variety.

Chapter one

Theoretical background on *sound transfer*

Introduction

Studying the effects of the first language on the second is crucial to the development of a better understanding of second language acquisition, and by extension, to the improvement of SLA teaching methodologies. Ausubel (1963 cited in Major, 2008) went so far as to say that all learning involves some kind of transfer. Furthermore, the subject of transfer has been a central point of study for numerous researchers for more than 60 years (eg; Fries, 1945; Lado, 1957; Weinreich, 1953). As a result: "...anyone seeking to understand transfer itself in all its manifestations needs to try to become familiar with a wide range of linguistic research..." (Odlin 2003, p.437).

The studies on transfer do not show signs of decline as "several books, collections of articles, and state-of-the-art papers in the last fifteen years or so show that interest in cross-linguistic influence remains strong (e.g., Dechert and Raupach, 1989; Gass, 1996; Gass and Selinker, 1993; Kellerman, 1984, 1995; Kellerman and Sharwood-Smith, 1986; Odlin, 1989; Ringbom, 1987; Selinker, 1992)" (ibid) (see also: Nation, 2003; Lightbown, 2008; Sparks, 2009; Bosma & Blom, 2017; Strickland & Chemla, 2018) Conversely "it is within the domain of L2 phonology that transfer has been most heavily researched, due to the recognition that it is within this area of acquisition that transfer is most prevalent." (Archibald, 2011, p.2).

This first part will be present a general review of the literature on cross-linguistic influence in general, and on sound transfer in particular. Explicitly, it will present the main schools of linguistic research and their views on the subject at hand, while briefly demonstrating the gradual evolution of the studies on transfer throughout the years.

1. Defining the phenomenon of language transfer

Transfer, is derived from the Latin word "transferre", which means "to carry over", "to bear" (Badcock, 1986) and when applied to knowledge or skills it can mean "the carry-over or generalization of learned responses from one type of situation to another". Also "the application in one field of study or effort of knowledge, skill, power, or ability acquired in another" (Krashen, 1992). In linguistics, transfer refers to the learner's use of their L1 in an effort to facilitate the learning of their L2. Consequently, this practice can either promote or hinder the learning process. However, second language acquisition is a complex object of study that has been studied for decades. And in order to understand the role of transfer on

SLA, it is necessary to take a look at the main theories on transfer in general, and phonological transfer in particular.

The oldest recorded instance of conceptualization of language transfer goes back to ancient Greece (Adams & Swain, 2002). However, scientific research on the topic only began in the 1950s. Since then, it has been an issue that intrigued, SLA researchers. One of the reasons for their increasing interest in the topic is the fact that it proves crucial to the development of a learner's L2. Therefore, being able to expose such a phenomenon and the circumstances around it would help researchers reach a better understanding of SLA. And in turn enable them to optimize language acquisition substantially. For the purposes of this study, the terms of learning and acquisition are used interchangeably and not in accordance with definitions such as Krashen's (1992), where 'acquisition' is an unconscious process easily spotted in young learners, while 'learning' is the academic approach to language acquisition, usually associated with classroom learning.

Giving a definition of transfer is no easy task as it requires one to take a look at the different definitions scholars put forward, and each produced an explanation based on their own findings. Weinreich was one of the first researchers to give a definition to transfer. It is "those instances of deviation from the norms of either language which occur in the speech of bilinguals as a result of their familiarity with more than one language" (1953, p.1) This definition, being one of the earliest, had an encompassing reach and attributed any deviation from the norm to transfer. Additionally, it focused on transfer which could happen in bilingual environments but has been applied to L2 learning by later researchers. However it considered transfer to be only deviations. Adding to that, Odlin (1989, p. 27) defines "transfer" as "the influence resulting from the similarities and differences between the target language and any other language that has been previously (and perhaps imperfectly) acquired". In other words, Odlin recognises transfer as a phenomenon that occurs beyond bilingual setting, and considers that both similarities and differences of the two languages play a predetermined role in the impact of transfer.

A decade later, Ellis (1997, p.51) suggested that transfer is: "the influence that the learner's L1 exerts over the acquisition of an L2." In other words, it is a strategy employed by the learner to facilitate their L2 learning. Eventually, transfer came to be recognised as a phenomenon of SLA, which depending on the circumstances, may hinder the learning process or facilitate it. Shatz (2017) proposes an explanation for positive transfer: "When the relevant unit or structure of both languages is the same, linguistic interference can result in correct language production called positive transfer: here, the "correct" meaning is in line with most

native speakers' notions of acceptability". All in all, the transfer has witnessed gradual evolution throughout the years, from a mostly negative phenomenon that plagues the SLA process, to a strategy of learning used by the learners to overcome their shortcomings, to a process that could both help or hinder the learning process. Accordingly, this dissertation will adhere to the latter theory.

The phenomenon of transfer was studied by scholars with divergent views. As a result, the terminology attributed to it differs greatly. To explain, Weinreich (1953) used the term 'L1 interference' as he focused on negative transfer. Corder (1983, 1992) on the other hand, referred to this phenomenon as "mother tongue influence" as he considered it to be a one-directional impact originating from the mother tongue and spreading to any second language. Others such as Kellerman and Sharwood Smith (1986) use the term 'cross-linguistic influence', which they define it as "the interplay between earlier and later acquired languages." This widens the scope of transfer and gives it a bidirectional property.

2. Historical overview on the studies of transfer

Throughout years of research, linguists have come to the conclusion that L1 acts as "major factor in SLA" (Ellis, 1990, p. 297). Accordingly, it is explained that there is an undeniable L1 influence in the various inter-language aspects of an L2 learner: vocabulary, speech, semantics, syntax, morphology and phonetics. And in order to comprehend language transfer, one must take a look at the development of the research around it, and examine the different views linguists had when dealing with it.

Scholars recognize three distinct periods related to language transfer research, each period carrying its own views, specifically: behaviourist, mentalist and cognitive (Ellis, 1994, p. 297-300). Behaviourists considered language learning to be a matter of habit formation, same as learning any other skill. Mentalists, on the other hand, regarded language learning as a creative development of the rules of the language. Finally, Cognitivists studied transfer as a bidirectional process, and believed that the areas of concentration should include the circumstances surrounding it.

2.1 Behaviourists' view of transfer

Behaviourism was, and still is, an important movement in the study of language learning. There exist multiple varieties of this principle such as 'methodological behaviourism' and 'radical behaviourism', but the sum of them agree on one extremely materialistic fundamental, which suggests that nothing exists outside of the physical world. In addition, Behaviourists argue that all phenomena are the result of interactions that could be

explained by simple physics. Thus, an abstract concept such as the mind has no place within this theory. They restrict the subject matter of psychology to human behaviour, which is observable and measurable, and set out to explain all kinds of behaviours including speech and language (Lyons, 1981, p.242). Behaviourism explains that a person's mind is a blank sheet at birth, and without external assistance, they possess no innate ability to acquire language. Furthermore they boil down language and language learning to a sum of behaviours that could be scientifically measured and studied. "Speech is very important to show the performance and evaluate learning through that performance. Performance is the actual use of language" (Dineen, 1967, p.80). In other words, learning a language is a task that is reduced to habit formation, similarly to any other skill. This process is governed by the principle of stimulus-response. To put it simply, a person acquires language after being exposed to stimuli. In this case, language input. Thus language production is a reaction of their part to a stimulus that instigates a response.

Behaviourists were among the first scholars to study the phenomenon of language transfer in SLA. In this respect, they considered transfer to be mostly negative and labelled it as 'interference'. Jakobovits (1969, p.56) states that: "The interest in transfer in second language learning has been most explicit in attempts at specifying interference effects through contrastive analysis between the second language (L2) and the first (L1)".

Weinreich (1953, cited in Major 2008, p.67) conducted research on phonological transfer and recognized several types of sound transfer:

- Sound substitution: when faced with a new sound the learner attempts to produce the closest L1 equivalent to the production of the L2, for example the use of the [b] sound instead of the [p] sound in an Arabic L1/English L2 context.
- Phonological processes: when "a learner uses the L1 allophonic variant that does not occur in the same environment in the L2, e.g., clear [l] in coda position for velarized [R] in L1 French/L2 English". (Allophones are different realizations of the same phoneme). However unlike sound substitution, this process requires the use of an allophone of the sound and not an entirely new phone.
- Over-differentiation when the L1 has distinctions that the L2 lacks. For instance, two sounds are unique phonemes in the L1 but are allophones in the L2, as in [d] and [ð] in L1 English/L2 Spanish)

- Under-differentiation : when the L2 has more distinctions than the L1, for example when two sounds are allophones in the L1 but separate phonemes in the L2, as in [d] and [ð] in L1 Spanish/L2 English).
- Reinterpretation of distinctions (reinterpreting secondary or concomitant features as primary or distinctive features, e.g., in L1 German/L2 English a learner interpreting English tense/lax distinctions as long and short distinctions)
- Phonotactic interference (making the syllable structure in the L2 conform to the L1 syllable structure, e.g., pic[i] nic[i] in L1 Portuguese/L2 English), and prosodic interference (e.g., producing falling intonation in utterance final words in L1 English/L2 Mandarin, regardless of the tone in Mandarin).

Weinreich's was the pioneer in terms of classification of the types of sound transfer. Eventually, Haugen's (1956) work on bilingualism in the Americas updated the terminology for some of Weinreich's categories: 'substitution' came to be known as 'simple identification', 'divergent' and 'convergent' 'sound transfers' replaced 'under-differentiation' and 'over-differentiation'. This dissertation however will not be tackling the subject of bilingualism, and will therefore use the former terminology.

To put transfer into perspective, let us have a look at a typical example of positive and negative transfer. When faced with a sound that is absent from their L1 inventory, an untrained learner is more likely to produce the closest possible sound they can make. Therefore, a novice French speaker presented with a new word such as "faith" /feɪθ/, will not experience any difficulties in producing a sound similar to the English [f] sound because it exists in the French sound system. Contrarily, Voiced dental fricative [θ], in the grapheme "th", would presumably trigger in the form of sound substitution with the sounds [s] or [f]. Thus they would produce a pronunciation that is approximate to /feɪs/.

A close inspection of the figure 1² above, the sounds [s] and [θ] are neighbouring sounds in terms of places of articulation. Therefore, EFL learners, whose native inventory of sounds do not contain these two separate sounds, may confound them and employ their L1 sound to fill in the gap of the sound they lack. These difficulties were attributed to the difference between the learner's L1 and their Target Language (TL), which called for a comparative study. Correspondingly, Lado (1957, p.23) developed Contrastive Analysis Hypothesis (CAH), which held the view that the level of difficulty experienced by the learners is directly related to the degree of linguistic differences between L1 and L2. The more systematically similar the two languages are, the more positive habits are imported from the L1 into the learning, and the production of the L2. Conversely, the more systematically different the two languages are, the higher the chance of errors. "Those elements that are similar to his native language will be simple for him, and those elements that are different will be difficult" (Lado 1957, p. 2). The Difficulty would manifest in the form of errors, the likelihood of which could be predicted and explained, according to CAH, by studying the distinctions and similarities of the two languages involved.

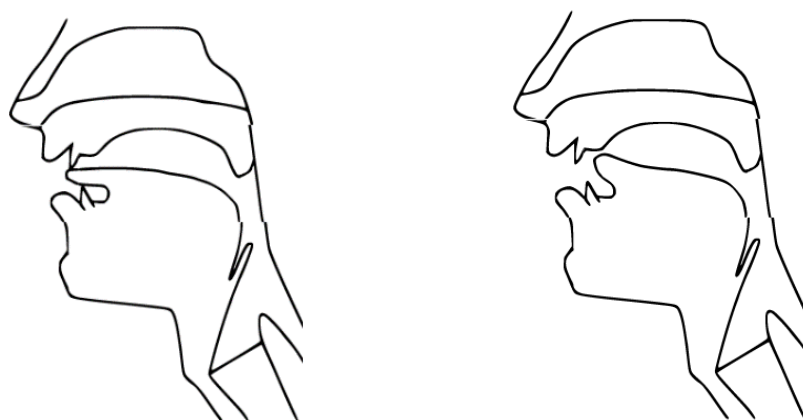


Figure 1: Places of articulation of the sounds [θ]and [s] respectively

Wardhaugh (1970, p.194 cited in Behfrouz 2014, p.1871) recognized two versions of CAH: a strong version that was focused on the prediction of transfer, particularly, negative transfer as a main source of L2 errors. As well as a weak version, that did not lack the predicative abilities of the strong version, but instead, attempted to examine errors after they occurred and not before. Moreover, it justified errors by the insufficiency of L2 knowledge on the part of the learners, and not by the direct influence of transfer. This dissertation will be

² All similar figures are created using Daniel Currie Hall's Interactive Sagittal Section website. <http://smu-facweb.smu.ca/~s0949176/sammy/>

using the strong version of CAH in the second chapter, as it will rely on its predicative powers to study transfer.

CAH puts forward a method for the comparison of any language systems of two languages in order to predict learner errors. It is common to use this procedure • (Ellis, 1985, p. 25-26).

- Description (i.e. a formal description of the two systems of sounds of both languages)
- Selection (i.e. specific elements are chosen to be focused on, the scope of the selection varies from single sounds to aspects of connected speech, depending on the study at hand)
- Comparison (i.e. the points of divergence and the points of similarity between the two systems of sounds are highlighted)
- Prediction (i.e., identifying which areas are likely to cause errors)

CAH was criticized for its inability to account for errors that did not have a clear L1 interference (Odlin, 1989; Ringbom, 2007). However, it continues to be effective in empirical studies of transfer. Brown (1994, cited in Dost & Bohloulzadeh, 2017) states that: “interference does exist and can explain difficulties, especially in the phonological aspects of second/foreign language learning”. Moreover, Ringbom (1994) states that “the predictions of CA work best in the field of phonology.” (cited in Mirzaei, Gowhary, Azizifar, & Esmaeili, 2015). Accordingly, applying CAH to phonology results in Contrastive Phonology, which is described as “the procedure of contrasting and comparing the phonological systems of languages to create their similarities and differences” (Yarmohammadi, 1995, p. 19). This practice was employed in this dissertation in accordance with the steps required by CAH.

While studying transfer, Behaviourists’ “intuitive accounts have focused on accents and culturally-specific learner styles as evidence of influences of L1 upon L2. The descriptivist-structuralist approach (Lado, 1957, 1971) looked at transfer as a way of supporting the usefulness of comparative analysis as a basis for language pedagogy” (MacWhinney, 1992, p. 4). The degree of transfer greatly depended on the similarities or differences between the native and target languages. Although behaviourists realized that the native language played an important role in SLA, they exaggerated L1 influences and ignored other factors that hindered SLA, such as learners’ individual differences. (cf. Dost & Bohloulzadeh, 2017)

To conclude, it was not surprising that during the 1970s interest in transfer dwindled. “In hindsight, these failures to support contrastive analysis could just as well have been

attributed to problems with the linguistic model and to limitations in the behaviourist framework, rather than to the process of transfer itself' (MacWhinney 1992, p. 4). However, the 1980s have witnessed renewed interest and acceptance of the importance of transfer in SLA (Gass & Selinker 1983, 1992; Han 2004; Han & Odlin 2006; Kellerman & Sharwood Smith 1986; Odlin 1989, 2003).

2.2 Mentalist view of transfer

Mentalism came as a reaction to behaviourism, in an attempt to reject its materialistic views that gave the human mind no credit whatsoever. In SLA, it suggests that learners' behaviour is a mere sign that their mental process is active.

Mentalists attempted to define transfer as: "the mental representations developed in the course of first language acquisition, which provide the starting point for the representations that will be developed for the second language." (Bialystok, 1994, p. 163). Han (2004) suggested that it is: "the attentional procedures developed for processing a first language are the basis for building up the new procedures needed for the second".

After the decline of CAH, The Creative Construction Hypothesis was put forward by Heidi Dulay & Marina Burt (1974) and Stephen Krashen (1981, 1982) and it suggests that learners are regularly developing new hypotheses in their minds about the form and their production in their TL. This hypothesis however, seems to exclude the domain of sound transfer, as it is difficult to disprove that fact that foreign accent is mostly caused by negative transfer. As a results, mentalists avoided phonetics experiments. Thus we will move on to the Cognitivists' point of view.

2.3 Cognitive view of transfer

The cognitive revolution in the 1970s brought about various new insights to the field of research. Cognitivism is centred around the idea that language acquisition is a cognitive task that involves assimilating new knowledge. It employs a multitude of cognitive systems as well as perception organs in operations such as information processing, perception, memory, problem solving etc... (Kellerman, 1977, p. 58-145). Furthermore, Kellerman (1983) defined transfer as a cognitive effort from the learner and not a merely reaction to certain linguistic encounters: "transfer has been characterized as a problem-solving procedure, or 'strategy', utilizing L1 knowledge in order to solve a learning or communication problem in L2". Additionally, they consider CAH to be insufficient in the study of transfer: "it is generally acknowledged that typological similarity or difference cannot on its own serve as a predictor for transfer, but interacts with other (linguistic) factors" (Faerch & Kasper, 1987, p. 121).

They list the 9 following factors : “1) age, 2) personality, motivation and language attitude, 3) social, educational and cultural background, 4) language background (all previous L1s and L2s), 5) type and amount of target language exposure, 6) target language proficiency, 7) language distance between the L1 and the target language, 8) task type and area of language use and 9) prototypicality and markedness of the language feature (p. 260-261). These parameters will later be presented in the methodology section of the second chapter.

In 1972, Larry Selinker proposed Interlanguage Hypothesis (ILH). Not only did it deny that interference was the only cause of learner errors, but it also provided a new explanation for the phenomenon of cross linguistic influence. He defined interlanguage as “the linguistic system based on observable output which results from a learner’s attempted production of a TL norm” (Selinker, 1972, p. 214). In other words, it is an “ever-evolving” natural language system that a non-native learner mentally creates, and it is composed of L1 forms, L2 forms, and “universals” that are neither L1 nor L2 forms (Vergun, 2006, p. 11). This linguistic system is created by the learners while developing their L2 to help them adapt to the L2. It can be said to be a temporary system that is dynamic and constantly changing in the learner’s mind (cf. Ellis, Rod, 1997). What sets this theory apart from the behaviourist views is that it gives credit to the learner for being an active agent in the learning process and not a mere subject the differences between their L1 and L2.” They work out their own phonological rules of the target vocabulary they are exposed to, leading to creation of new phonological structures which are not found in both the target language and their first language” (MWANIKI, 2013).

In his *interlanguage*, Selinker (1972) introduced the concept of Fossilisation, a phenomenon of SLA that was described as “a distinctive characteristic of second language learning” (Han, 2004; Selinker, 1996; Douglas, 1994) most pervasive among adult L2 learners (Han & Odlin, 2006; Kellerman, 1995; Schachter, 1996). Fossilisation is also described as “any lack of progress in L2 learning regardless of its nature” (Shin, 2009, p. 60). To explain the relationship between these two phenomena, Selinker states that “fossilisation is the linguistic items, rules, and subsystems which speakers of a particular [language] will tend to keep in their [interlanguage] relative to a particular [target language], no matter what the age of the learner or amount of explanation and instruction he receives in the [target language]” (1972, p. 215). Corder offers a similar definition: “the phenomenon of ‘fossilisation’, where a learner’s interlanguage ceases to develop however long he remains exposed to authentic data

in the target language” (1981). Furthermore, “Selinker (1972, cited in Khansir, 2013) identified five fossilisation processes as follows:

1. Language Transfer: sometimes rules and subsystems of the interlanguage may result from transfer from the first language.
2. Transfer of Training: some elements of the interlanguage may result from specific features of the training process used to teach the second language.
3. Strategies of Second Language Learning: some elements of the interlanguage may result from a specific approach to the material to be learned.
4. Strategies of Second Language Communication: some elements of the interlanguage may result from specific ways people learn to communicate with native speakers of the target language.
5. Overgeneralization of the Target Language Linguistic Materials: some elements of the interlanguage may be the product of overgeneralization of the rules and semantic features of the target language.”

In the field of phonetics, Selinker (1972) observed that it was rare for learners of an L2 to successfully reach full native-speaker competence. His calculations estimated the success rate at “a mere 5%” (p. 212). This concept was heavily studied by scholars for the next decades (e.g., Acton, 1984; Birdsong, 1992, 2004, 2006; Han, 2004, 2009, 2011, 2013; Han & Odlin, 2006; Kellerman, 1995; Long, 2003; Selinker, 1972, 1996), and was extrapolated to various language domains, pragmatic, syntactic, morphological, semantic and phonetic fossilisation.

According to Hişmanoğlu (2007), fossilised pronunciation errors are chronic articulation mistakes made by language learners in the acquisition of the phonological system of the target language which continue for a long time and cannot be easily solved, they state that the main reason why language learners make fossilised pronunciation errors is that they apply the phonological rules of their mother tongue to those of the target language. Furthermore, Selinker & Lakshamanan, (1992, p. 197–216) performed a case study on adults and children to explore the link between transfer and fossilisation and found that language transfer seems to be either the main factor or a cofactor.

“Researchers have taken liberties with the term “fossilisation” and have attributed a variety of behavioural reflexes to the term. Among them are backsliding, persistent non-target-like performance, typical error, cessation of learning, errors that are impervious to negative evidence, and errors made by advanced learners” (Han, 2004). Accordingly, The concept of fossilisation are relevant to our topic seeing that the case study carried out for this

dissertation examined the English pronunciation of a group of advanced learners, who have presumably been exposed to authentic data for more than 10 years, and which may still produce intermediate level errors of pronunciation and distribution of phonemes. (See chapter 2).

To conclude, Sound transfer was heavily studied by behaviourists through the scope of negative interference; they used CAH in an attempt to predict errors caused by L1 and L2 differences. The cognitivists in turn, put forward interlanguage to explain that errors occur because learners develop an independent system to help them overcome their L2 difficulties. And lastly, mentalists did not contribute to the study of sound transfer and considered pronunciation errors to be developmental errors. This following section will perform a modest comparative study between the modes of pronunciation in French compared to English, as well as a phonetic comparison between some English sound and their French equivalents.

3. French as an L1 and English as an L2

French has been classified by linguists as a Romance language belonging to the Gallo-Romance branch of ‘Romance languages’ (Camproux, 1974), while English is part of the West Germanic branch of the Germanic languages. These two families, in turn, originate in the Indo-European family of languages. The shared genealogical heritage is part of the reason why these two languages appear strikingly similar. To illustrate, French and English share approximately 10,000 cognates³ (Hammer & Monod, 1976), a great percentage of which stem from Greek and Latin (Baugh & Cable, 1978), which permeated the lexicon of European languages. For example: ‘presentation- présentation’, ‘west-ouest’. A portion of the cognates may have come after the fall of the Roman Empire, with the Germanic tribes and the Gaul invasion. Additionally, the French and the English have been coexisting in the general geographical area for a considerable amount of time, which allows for a great deal of borrowing of words between their two languages. “The process of borrowing requires at least some contact between the two languages, rudimentary understanding of the meaning of word and a minimal tendency to bilingualism” (Kowner, 2008, p. 12). Conversely, “borrowing comes to have a major effect on lexical semantics, there is often a great deal of cross-linguistic syntactic influence as well. Phonology is most unlikely to be affected by borrowing. (Odlin, 1989, cited in Chung, 2001, p. 26). Swan (2001, p. 52) explains that “there are some similarities between French and English, both in syntax and vocabulary. The phonological

³ Cognates are traditionally defined as word forms which have descended from a common parent word (Schmitt, 1997, as cited in Otwinowska-Kasztelanic, 2011)

systems exhibit some important differences, however, and this usually present French speakers with problems in understanding and producing spoken English, and in making links between spelling and pronunciation”. Furthermore, “The difficulty in developing an accurate algorithm to perform this task is directly proportional to the fit between graphemes and corresponding phonemes as well as the allophonic complexity of the language in question.” (Divay & Vitale, 1997, p. 496).

3.1 Grapheme-phoneme correspondences

The study of grapheme-phoneme relationships is part of the old tradition of descriptive comparative grammar. Accordingly, it is crucial for this dissertation to briefly mention the concept of the rules that govern the spelling-sound associations of English and French, to demonstrate some difficulties they may impose on reading activities, considering that the experiment conducted in this dissertation is a reading exercise.

“There have been some important studies done on grapheme-phoneme correspondences in past years; for English: Ainsworth (1973), Bakiri and Dieterich (1991), Bernstein and Nessly (1981), Elovitz et al. (1976), Hertz (1979, 1981, 1982, 1983, 1985), Hunnicutt (1976, 1980), Levin (1963), McCormick and Hertz (1989), McIlroy (1974), O'Malley (1990), Venezky (1962, 1970), Venezky and Weir (1966), Vitale (1991), Weir (1964); for French: Auberg4 (1991), Catach (1989), (1992), Cotto (1992), Divay (1984, 1985, 1991, 1994), Laporte (1988), Prouts (1980), Yvon, (1996)” (Divay & Vitale, 1997, p.496). These studies suggest is that there are major differences in the rules of grapheme-phoneme correspondences between English and French. Namely, a phoneme in both languages can have multiple spellings. Démonet explains : “ En anglais, il existe 1120 combinaisons de lettres (graphèmes) pour représenter les 40 sons (phonèmes) que contient cette langue ! En français, plus de 190 graphèmes différents peuvent être utilisés pour écrire les 35 phonèmes qui composent notre langue” (2001). Accordingly, Divay & Vitale (1997, p. 499) provide several examples among which we note “the grapheme sequence *ough* as in *rough*, [ʌf], *though*, [u:], *bough* [əʊ], *thought* [ɔ:], *dough* [əʊ], *cough* [ɒf] and *hiccough* [ʌp]”. Similarly, in French “the grapheme sequence: *x* is pronounced [ks] in *axiome*, [gz] in *exemple*, [s] in *soixante*, [z] in *sixième*, and [] (not pronounced) in *auxquels*”.

The rules of sound-grapheme distribution in each of the two languages are unique, which creates difficulties in reading exercises for L2 learners. Sprenger-Charolles (2003, p. 48) writes: “another reading problem, specific to French and English, is that some written

consonants are silent. In English, at the beginning of a word, *kn* becomes /n/ as in *know*....in French the silent consonants are mainly at the end of the words, but are often pronounced with the following word when it begins with a vowel. For example *petit ami* is pronounced /pətitami/. Furthermore, “another difficulty for the spelling of English and French consonants is related to the fact that they can be geminated without clear phonological properties, except in two cases. First in French and in English *ss* always corresponds to [s], never to [z]. Second, in French the presence of a double consonant modifies the pronunciation of the vowel *e* which corresponds to [e], [ɛ] as in *nette* and not to [ə] as in *petit*. Therefore, gemination mostly penalizes word spelling” (ibid).

The conclusion is that the rules of phoneme-grapheme associations in both English and French are the products of the natural evolution of Language, which is under the influence of various non-linguistic factors, such as the Norman invasion (1066 AD), mass immigration to the USA and Canada, the great vowel shift (1400-1500 AD) (Wells, 1982 cited in Divay & Vitale 1997, p. 498). Consequently, it is more accurate for a comparative study to rely on the examination of phonological systems rather than the phoneme-grapheme correspondences. Divay & Vitale write: “The paucity of literature in grapheme-to-phoneme translation is partially due to the fact that the field of linguistics, and in particular, descriptive linguistics, has traditionally shied away from the writing system (except as a study in its own right) since the phonological system was considered of primary importance” (1997, p. 496). It is for this reason that this dissertation will rely on a phonological comparison as proposed by CAH in order to examine the effects of transfer on the phonetic production of French EFL learners.

3.2 Modes of articulation

According to Williams-Lacroix (1995) speaking a foreign language changes the speaker’s voice, their gestures, facial expressions, tones and even personality. This could be explained by what Sweet (1890, p. 69) referred to as, ‘organic basis’. He suggests that: “Every language has certain tendencies which control its organic movements and positions, constituting its organic basis or the basis of articulation. A knowledge of the organic basis is a great help in acquiring the pronunciation of a language.”

Williams-Lacroix also argues that the settings of English articulation are fundamentally different from those of French. As a result, English speakers tend to be more composed and relaxed when articulating, whereas French people may seem more tense and

“nerveux”, as he labelled it. More specifically, this is governed by multiple parameters, such as breathing, length of sounds, the places and manners of articulation used, word stress and rhythm. Expressly, Abercrombie (1967, p. 97), writes: “As far as is known, every language in the world is spoken with one kind of rhythm or with the other ...French, Teluguan and Yoruba...are syllable-timed languages... English, Russian and Arabic...are stress timed languages”. On the other hand, French is a ‘syllable timed language’ which means that “all French words of two syllables or more are stressed in a regular way, unlike the English system where the stress pattern for each word-type must be learnt. This can lead to problems of comprehension and comprehensibility.” She later explains that “vowels which are not stressed retain their pronunciation, rather than being shortened, or weakened to [ə] or [ɪ] as in English. So French speakers have great difficulty in perceiving shortened or weakened syllables when English speakers pronounce them” (Swan, 2001, p. 53-55).

This difference in rhythms plays a huge role on the way sentences are uttered in the two languages. However, what most French students fail to realize is that they are trying to speak English the same way French is spoken. Putting English in the mould of a “syllable timed language” as well as using the French sound system to produce English sounds. Tranel (1987, p. 35) explains that these two rhythms are “...absolutely fundamental characteristics separating the two languages and they have a deep global influence on the pronunciation of vowels. It is very important then, to avoid using the rhythm of one language onto the other”.

To explain the differences between the rest of the parameters, we should take a look at the work of Delattre (1951). In which he highlighted the major phonetic differences between the pronunciations of French and English. He argued that there exist specific settings of articulation, other than the phonemic differences, that are unique to each of the two languages “...nous proposons-de ramener toutes les caractéristiques du français à trois modes: le Mode Tendu, le Mode Antérieur et le Mode Croissant, le mot “mode” étant pris au sens où l’on entend “ mode majeur” et “mode mineur” en musique, ces modes ne s’excluent pas rigoureusement. Il s’agit de très fortes tendances, et telle caractéristique phonétique se rapportera inévitablement à plus d’un de ces modes à la fois...” These three modes are crucial to help us understand the way transfer functions between French and English.

3.2.1 Le Mode Tendu (Tense mode)

French pronunciation is characterized by being relatively tense and stiff due to the fact that more energy is spent in the endeavour of pulling articulatory muscles to perform phonetic

tasks. Fouché (1936, cited in Delattre 1953, p. 95) claims that French is the most demanding language when it comes to muscle tension: “Nulle part la tension musculaire n'est comparable à celle qu'exige une prononciation française”. This tension imposes rigidity on the tone of articulation of French by keeping the articulatory muscles tense and unmoving with each pronunciation, with no transition between sounds that could shorten or lengthen them. To illustrate, we can compare the pronunciation of the French word *chaud* [ʃo] with the English word *show* /ʃoʊ/ in American English or /ʃəʊ/ in RP English. Expressly, the articulation of the word *chaud* requires a rigid tone that almost freezes the mouth in a specific position, whereas the English word *show* is more malleable, as the diphthong [əʊ] requires constant movement throughout its realisation. This rigidity, according to Delattre (1951), is responsible for differences that dictate what a sound system can contain. Mainly:

- French sounds are characterised with a stable ‘timbre’⁴. Léon (1975, p. 60) explains that: “la tension musculaire garde à la voyelle le même timbre du début à la fin”. On the other hand, English sounds require a change of timbre in their pronunciation. To illustrate, let us consider the English word *doubt* /daʊt/ and the French word *vite* /vit/, which contain the diphthong [aʊ] and the close front vowel [i] respectively. What should be noticed here is the relative stability of the timbre of the vowel [i], compared to the pronunciation of the diphthong [aʊ] which requires constant movement. Peereman & Content (1998, p. 47) suggest that: “all English vowels are more or less diphthongised, i.e articulated in a constant movement. Thus, the quality of the starting vowel progressively changes from the beginning to the end”.
- the French sound system is devoid of diphthongs, as almost no movement between sounds is permitted. ([e] and not [ei], [o] and not [ou])
- Movement between consonants is also prohibited therefore there are no affricate sounds in French ([ʒ] and not [dʒ], [ʃ] and not [tʃ]), except for the pronunciation of foreign words.

This mode of articulation is acquired unconsciously by the French native and will therefore remain undetected unless specifically studied. English on the other hand is described as a relaxed language where relatively less muscle tension is required to perform articulatory

⁴ Timbre is “The attribute of auditory sensation in terms of which a listener can judge the dissimilarity between sounds of otherwise identical pitch, loudness and length... timbres can be established to distinguish between the frequency characteristics of individual sounds (such as vowels, fricatives)” (Crystal, 2011 p. 485)

tasks. As a result, the pronunciation of English is described to be more flowing. As the organs of speech move seamlessly from one point of contact to the other in one long fluid motion.

All in all, muscle tension governs the movement of the organs of articulation, that is to say: the muscles of the tongue, the jaw, and those of the lips. The greater the tension, the more rigid the muscles, the less interaction there is between sounds in the same word. The opposite is also true, the lesser the muscles tension, the more malleable the muscles, which allows for more intermingling between the sounds that occur together.

3.2.2 Le Mode Antérieur (Frontal mode)

The tense mode of articulation of the French language pushes the resonance chamber of most sounds to a frontal position. This mode affects three parameters of pronunciations: the places of articulation of most French sounds, the shape of the tongue and that of the lips at the moment of articulation.

3.2.2.1 Frontal places of articulation

Delattre (1951) suggests that French sounds are more likely to be produced in the frontal part of the oral cavity, rather than in the posterior part of it, and when compared to English, every sound shared by the two languages, and which involves the tip of the tongue in its phonetic conception, is more frontal in French than it is in English. For example the consonant sounds [t], [d], are produced between the tongue and the alveolar ridge in English, whereas in French, the same sounds are produced between the tongue and the back of the upper incisors. This will be illustrated with figures later on.

3.2.2.2 The shape of the lips

The shape of the lips plays an important role in the articulation of different sounds. they can be rounded, spread or neutral. “French uses tenser, more rounder lips and more frequent jaw movement” (Swan, 2001, p. 53). “whereas in English, the jaw-movement is so slight and the internal setting such, that the tongue is hardly ever visible during utterance” (Honikman, 1964, p. 75). Delattre (1966, p. 12) explains that the position of the lips in the pronunciation of a French vowel can affect the consonant that precedes it: “Du fait de l'anticipation vocalique, les consonnes sont mises d'avance dans la position de la voyelle qui suit. Cela se remarque surtout lorsque la voyelle est arrondie: les lèvres françaises s'arrondissent dès le début de la consonne...Ainsi toute consonne qui est suivie d'une voyelle

arrondie s'articule elle-même avec les lèvres arrondies ”. In his explanation, he suggested to take a look at the French word *pour* /pʊʁ/ and the English word *poor* /pʊr/, when pronounced by an American speaker. “Dans le premier cas les lèvres se séparent en position déjà arrondie (avancée), dans le second elles se séparent en position plate, et s'allongent seulement plus tard pour la voyelle” (ibid). In conclusion, the movements of lips in the French are more tense and more mobile than in English, which impacts the pronunciation of most of vowels.

3.2.2.3 The shape of the tongue

The shape of the tongue regulates the flow of air through the oral cavity which is one of the parameters that allow for the production of a variety of vowels. To explain, the tongue can take a convex shape which creates a frontal resonance chamber, or a concave shape that pushes the resonance chamber to a posterior position. Moreover, the tongue can be raised to

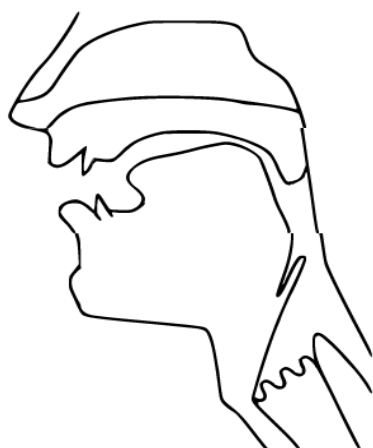


Figure 2: The tongue in a convex shape when pronouncing the French sound [ʁ]



Figure 3: The tongue in a concave shape when pronouncing the English [r] sound

the roof of the oral cavity for the articulation of close sounds such as [i:], or be lowered flat in the mouth as it is required in the articulation of the open sound [a].

Wilson (2006, p. 6) states that “the French tongue body would be higher because it is convex to the roof of the mouth, whereas the English tongue body is concave to the roof of the mouth and would therefore be lower”. Accordingly, the figures 2 and 3 above illustrate the effect the tongue has on the placement of the resonance chamber. The sounds compared are: The English post-alveolar frictionless continuant [r], and the French a voiced uvular approximant [ʁ]. Expressly, the convex shape of the tongue in figure 2 directs the resonance of the sound to a frontal position, whereas the concave shape of the tongue in figures 3

favours a posterior resonance. This frontal against posterior resonance is what makes one's speech sound more French or English respectively.

To sum up, the articulation of French sounds is mostly in frontal places of articulation, it also shapes the tongue in a way that favours a frontal resonance. Conversely, the articulation of English sounds employs a plethora of posterior positions.

3.2.3 Le Mode Croissant (the rising mode)

Delattre (1951) explains that the terminology used here should not be understood separately, but as two opposing sides. The word rising refers to syllable intensity, and as there is no syllable that is completely rising. In addition, most French syllables are "open", in other words, they end in a vowel. As a result, the continuous and stable muscle tension ensures that a French syllable gains increasing intensity that is maintained until a point close to the end of the syllable. The English syllable on the other hand loses intensity at a point that is close to the beginning. This dissertation deals with the production of phonemes rather than syllables, under the possible influence of transfer. 'Le mode croissant' governs syllable intonation and, and will therefore not be developed any further.

To sum up, the three modes of pronunciation that set the articulation of French apart from that of English influence the places of articulation of sounds, as well as the degree of muscle tenseness during the articulation of sounds. In addition, these modes are acquired unconsciously by the native speaker and can prove to be difficult to perceive let alone overcome.

4. Phonetic points of interest between English and French

This section will attempt to perform a modest phonetic comparison between an assortment of common sounds between the two languages, as well as a set of English specific sounds and their closest equivalents in the French sound system. The analysis will be in terms of their places of articulation, their manners of articulation while keeping in mind the different modes of pronunciation described above.

Flege states that "many aspects of L2 production can be understood in terms of how L2 sounds are categorized" (1992, p. 566). Thus, performing phonemic level analysis, in accordance with the steps dictated by CAH, should allow us to perceive the technical differences and similarities between the sounds of French and English. By doing so, we can discern "similar" from "new" sounds, as proposed by Flege in his Equivalence Classification

Hypothesis (1987, p. 47). He states that “the perceived phonetic distance between sounds in the L2 and those in the L1 is the main factor in determining new sounds” (ibid). Specifically, sounds that are L2 exclusive because they require an articulatory parameter that is absent from the L1, and which, according to CAH, could constitute a difficulty in the form of possible negative transfer. Such sounds could be referred to as ‘systematic gaps’. Oda (2011) explains that they “are based on a certain physical activity, that is to say, lack of a movement, lack of an air flow, etc. Phonetic bases hold to segments with different syllabic affiliations (onset, nucleus, coda) and with different articulators (e.g. dental, alveolar, palato-alveolar, or front, mid, back), in the sense of identical phonetic category”. This constitutes a point of interest for this dissertation, because the pair of languages selected for this study contains such gaps.

The sounds that will be described in this section are the following:

- The simple vowels [ə] , [e] , [ʌ] , [ɑ:] , [æ] , [ɒ] , [ɔ:] , [i:] , [ɪ] , [ʊ] , [u:]
- The diphthongs [aʊ] , [eɪ] , [aɪ]
- The consonants [p] , [t] , [k] , [b] , [d] , [g] , [f] , [v] , [s] , [z] , [ʃ] , [ð] , [θ] , [h].

The comparison includes nearly all the simple vowels in the English inventory. And that is because they are the nucleus of the syllable (De Jong, 2004). In other words, they shape the pronunciation of the entire segment. Additionally, vowels can serve as excellent example for the demonstration of the effects of transfer, as they require unique pronunciation parameters in each language. Furthermore, the inclusion of the diphthongs as well as the fricative sounds [ð] , [θ] , and [h] should provide us with a prime example of the way advanced learners cope with systematic gaps. And lastly, according to Flege’s Equivalence Classification Hypothesis, sounds that share the same IPA symbol can safely be considered ‘similar’. In this respect, the remaining consonants on the list will be compared to their French equivalent, to serve as example for potential positive transfer.

4.1 The IPA

The alphabets of French and English are comprised of 26 letters, yet the French phonemes inventory counts 37 phonemes, while the English system counts 44. Such a surplus of sound to symbol ratio forced the International Phonetic Association (1999) to develop the IPA or the International Phonetic Alphabet in the late 19th century, as a standardized representation of the sounds of spoken languages. In this system, each sound, including

English sounds, is represented by a symbol, all in an effort to insure a high level of precision in any phonetic analysis, especially considering that languages that share the morphology of their cognates do not agree on their pronunciation. Szigetvári suggests that “if a word is semantically and/or etymologically related to another word, this does not entail that it must be derived from it phonologically. For example, *go* and *went* are semantically related, *father* and *paternal*, even *tooth* and *teeth* are both semantically and etymologically related, yet relating them phonologically is not common in current phonological practice” (2018, p.86). Such discrepancies come from the fact that languages are systematically different, some languages use graphemes that generally follow the phonemes, such as French: “French graphemes representing vowels mainly refer to the same phonemes (Catach, 1986; Véronis, 1986 cited in Sprenger-Charolles, 2003), while other languages have a pronunciation that rarely corresponds to the spelling, Schane (1970, p. 137) explains that: “it is a well-known fact of life that English orthography is far from perfect, that it is full of inconsistencies, irregularities, and out-and-out oddities. What this means is that spellings are often not phonetic, that the relation between letter and sound is much less direct in English than it is in languages such as Spanish or Italian”.

And lastly, the study of vowels requires a meticulous inspection at their places of articulation as well as the height of the tongue, consequently, the Jones diagram of cardinal vowels will be utilized to illustrate the movement of vowel sounds, accordingly, all of the diagrams are cited from Ginésy (2014, p. 15-43).

4.2 Vowels

Vowels can be described as: “...harmonious voiced sounds of language coming from the vocal cords and modified by the buccal cavity, vowels differ between one another because of the position of the lips and tongue which alter the shape and volume of the buccal cavity, thereby giving the vowel its quality” (Monod 1971, p. 88). Furthermore, vowels are produced with an open vocal tract, with air escaping through the oral cavity (at least a portion of the airflow must escape through the mouth). Undeniably, some languages, such as French, contain nasal vowels, which are sounds produced by releasing air through the nasal cavity. (see table 1 below for French nasal vowels). Adding to that, vowels are also mostly frictionless, unlike numerous consonants that require some manner of contact of the articulatory organs, and continuant (Cruttenden 2014 p. 27) in other words, they can be produced ceaselessly depending on the amount of air the lungs of the speaker can muster. And

lastly, vowels are produced primarily by the vibration of the vocal folds which puts them in the category of voiced sounds.

“Standard French has sixteen vowel sounds, four of which are nasal phonemes” (Walker 1984, p. 13). The English system, on the other hand, contains 12 pure vowels or monophthongs⁵. In addition, pure vowels in English are classified as either ‘lax’ or ‘tense’ vowels, Wood (1975, p.109) explains that “there is a well-known tendency for tense vowels to be longer than lax vowels. This is usually said to be due to the tense gestures taking more time to execute”, such a distinction between pure vowels does not exist in the French pronunciation system, as a result, and based on CAH, vowel length should constitute a difficulty for EFL

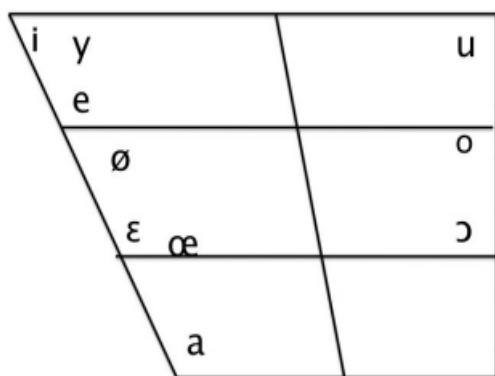


Diagram 1: Standard French oral vowels
Wioland (1991, p. 30)

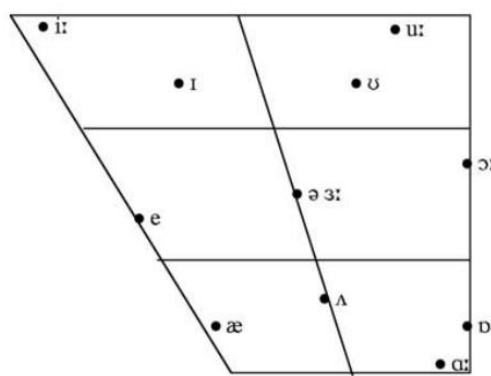


Diagram 2: RP English pure vowels
Roach (2004)

learners from a French background.

Diagrams 1 and 2 above reveal the position of pure vowels from each of the two languages, and what should be noted is the concentration of the majority of the English vowels in central and back positions, as opposed to the vowels of French which seem to converge mostly on the frontal part of Jones diagram, due to the frontal mode of pronunciation that characterises the language. The French sound system contains two sets of rounded vowels: the frontal vowels [y, ø, œ], and the back vowels [u, o, ɔ], In addition to one set of non-rounded central vowels [i, e, ε]. Whereas in English, the only rounded vowels are in the mid and close back vowels [u], [ʊ], [o], [ɔ] (Russell, 2005).

⁵ monophthong (n.) A term used in the phonetic classification of vowel sounds on the basis of their manner of articulation: it refers to a vowel (a pure vowel) where there is no detectable change in quality during a syllable, as in English cart, cut, cot. (David crystal (2008).

This comparative analysis we will begin by looking at the vowels of English compared to their French counterparts. The table 1 below classifies the vowels of standard French, as presented by Léon (1966), in parallel with RP English vowels as illustrated by Roach (2004) based on their places of articulation for easier comparison.

Table 1: Vowels of Standard French in parallel with vowels of RP English

	Standard French vowels	RP English vowels
Orals	[a] aller -patte – moi [ɑ] âne – (un) gars - pâté [œ] leur – cœur – le [ø] (des) œufs – du feu [i] il – ici – le nid - lui [ə] ce – de – le - revenir [e] école – année - donner [ɛ] air – elle – mère [o] odeur – jaune - beau [ɔ] ordre – comme – le [y] une – du – nature - rue [u] ou – ouvrir – la poule	Short vowels [ɪ] pit [e] pet [æ] pat [ʌ] cut [ɒ] pot [ʊ] put [ə] about Long vowels [i:] key [ɜ:] cur [ɑ:] half [ɔ:] paw [u:] coo
Nasals	[ɔ̃] on – oncle – répondre [ɑ̃] en – enfant – grand [ɛ̃] instant – peinture [œ̃] un - parfum	
Diphthongs		[eɪ] bay [aɪ] buy [oɪ] boy [aʊ] cow [əʊ] go [ɪə] peer [eə] pear [ʊə] poor

4.2.1 Simple vowels

Phonemes are unique because each one requires specific configurations to be pronounced accurately. Accordingly, when a speaker assumes and maintains a single configuration when producing a vowel, that is to say, without any movement of the tongue,

lips or jaws, then the vowel produced is known as a pure vowel, also referred to as simple vowels or monophthongs. These terms will be used interchangeably in this dissertation.

4.2.1.1 The sound [ə] as in *about*

The most recurring sound In English is the SCHWA (Knight 2012, p. 71). It occurs in the majority of unstressed syllables especially if syllabic consonants are not present, however, this does not imply that every unstressed syllable contains the central vowel [ə]. Moreover, According to Delattre (1965), over 50% of the vowels in connected speech can be neutralized in English. “Therefore, when reading English words, you can be right half of the time if you use a schwa instead of the specific vocalic grapheme!” (Peereman & Content, 1998, p. 46).

This vowel sound is produced with the organs of speech in a neutral position, which

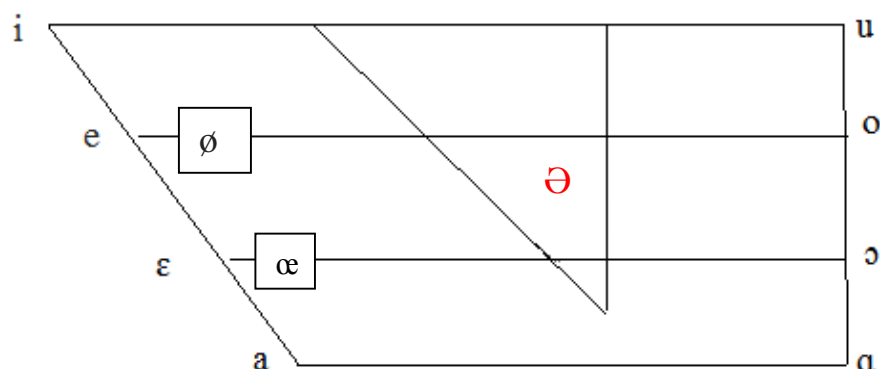


Diagram 3: The central vowel schwa on the French diagram of vowels

means that the tongue is resting flat in the mouth, and the lips are in a neutral position (see figure 6 below), in other words, neither rounded nor spread (Fournier, 2010, p. 152).

The diagram 3 shows that the closest French sounds to the English SCHWA⁶ are: [ø] as in “bleu” /blø/ and [œ] as in “heure” /œʁ/. These sounds are located in a mid-frontal position as opposed to the central position of the SCHWA, in addition, they require some degree of rounding of the lips. However, being the closest French equivalents to the English SCHWA, makes them suitable candidates for sound substitution. Alternatively, Heim (2006,

⁶ Schwa was part of the French sound system until the classical period where it transformed into e caduc, or e muet, or even e instable. It's occurrence is rare in standard French and its confusing resemblance to the sound /ø/ which is rounded, it should therefore not be used as a point of comparison(Pierre R. Léon 1992)

p. 77-94, p. 105-107) suggests that the central sound [ə] might be replaced with the frontal mid open sound [ɛ], and even the frontal open sound [i] if the suitable grapheme is present.



Figure 3: Aperture of the vowel [ə]

All in all, the schwa is a vowel sound that is heavily influenced by syllable stress, which could create difficulties for French students as to when to reduce a vowel to a schwa. Furthermore, the central position of the SCHWA remains unused in the French diagram of vowels, which makes it a systematic gap for French natives and a major source for negative transfer.

4.2.1.2 The sound [e]⁷ as in *shed*

Jones diagram reveals that the English sound [e] is situated between the two frontal French sounds [e] and [ɛ] as in *fée* and *fête* respectively. It is a front mid open unrounded vowel. However, when compared to its French equivalents, it becomes clear that it is more centralised, and requires minor spreading of the lips.

⁷ There doesn't seem to be a general consensus on what symbol to use for this sound, as Ginésy, Lily & Viel, and Fournier use the /e/ symbol while the IPA and Kenyon and Knott *A Pronouncing Dictionary of American English* use the /ɛ/.

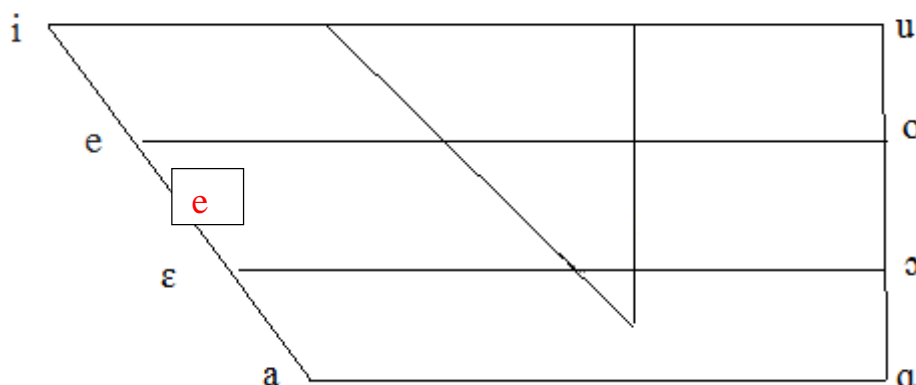


Diagram 4: The English vowel [e] in the French diagram of vowels.

The tense mode of pronunciation would compel French students to attribute more spread to English vowel [e], in addition, the frontal mode would insure they pronounce it in a more frontal position. To illustrate, one of the typical erroneous substitutions for this sound is to replace the English vowel [e] with the French [e] sound in the grapheme “e”, in cognates such as the word *intelligent* /ɪntɛlɪdʒənt/ (Ginésy 2014, p.20).

4.2.1.3 The sound [ʌ] as in *but*

Also known as the *Strut*, the sound [ʌ]⁸ is an open-mid back unrounded vowel (Lindsey, 2012). In other words, it is produced with the tongue raised halfway to an open vowel such as [ɪ], and with the tongue retreated to the back of the mouth, nevertheless, it is counted as a central vowel. Additionally, Jones (1967) argues that the sound [ʌ] is in fact the stressed SCHWA based on their proximity on the diagram and the similarities between their articulation parameters. Furthermore, “(The IPA symbol for this region in the diagram is /ɚ/; [ʌ] is kept partly for traditional reasons and partly because a more back vowel is used in many dialects)” (Cruttenden, 2013). However, since the French researchers cited in this dissertation employ the symbol [ʌ], this dissertation will conform to this choice to avoid confusion.

Fournier (2010, p. 156) deems this vowel sound to be among the most challenging for a French native to master. He explains that the French sound system, or “grid” as he refers to

⁸ Figure 7 and all similar ‘aperture’ figures are from *English Language Centre*, The Hong Kong Polytechnic University website. <https://elc.polyu.edu.hk/sounds/lesson3.htm>

it, does not contain any sounds that are located in the central position of the [ʌ] sound. Heim (2006, p. 77-94, p. 105-107) predicts that the strut could substituted for the French sounds [œ], [ø] or the English [ʊ]. Furthermore, Fournier (2010) explains that the closest sounds to the [ʌ] are either the frontal unrounded vowels [a], [ɛ] or the rounded back vowels [ɑ], [ɔ] and since these vowels are already in use in the English sound system, not to mention the effects of the frontal mode of pronunciation, a French speaker would not use them to replace the [ʌ] sound. They would rather employ frontal sounds such as [œ] despite the fact that it is a rounded vowel whereas [ʌ] is unrounded. In this respect, Fournier points out the fact that all of the French back vowels are rounded, which creates a “muscle reflex” that attributes roundness to all back vowels. This effect is in turn, transferred to the production of the back vowels of English.

4.2.1.4 The sound [ɑ:] as in *bark*

Faure (1975 cited in Ginésy 2014, p. 22) presented an analogy to illustrate the vowel sounds [ɑ:], which he called the [ɑ:] of the doctor, as the accurate realisation of this sound requires the oral cavity to be fully opened, and the tongue to be lowered flat, as if to have one’s amygdalae examined by a doctor. These parameters are not far from the ones required for the pronunciation of the French sound [ɑ] in the word “pâte” in its most marked iterations (Ginésy 2014, p.22). The two sounds diverge on the following points:

- Given the distinction between the modes of pronunciation of French and English, the English sound [ɑ:] has a more protracted realisation than the French equivalent.

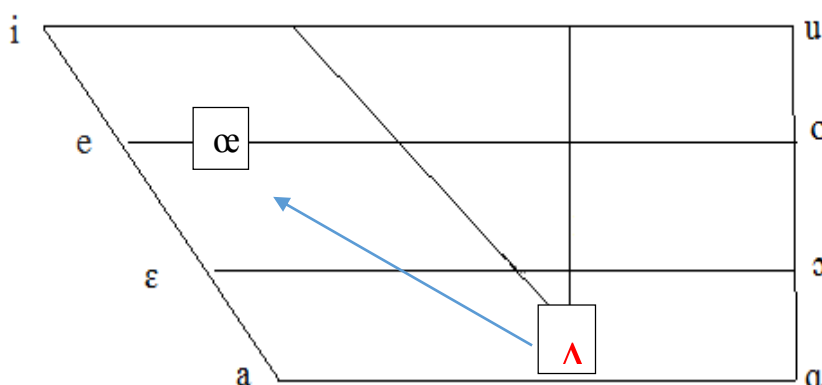


Diagram 5: The English vowel [ʌ] in the French diagram of vowels.

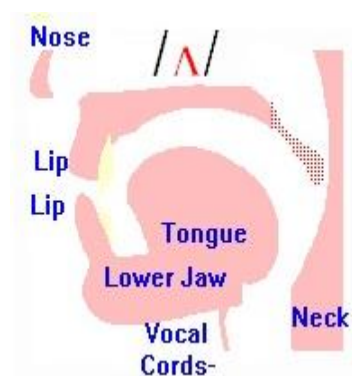


Figure 7: [ʌ] vowel aperture

- The French pronunciation system imposes a great deal of muscle tension during the pronunciation of sounds, therefore the French sound [ɑ] calls for greater spread than the English [ɑ:]

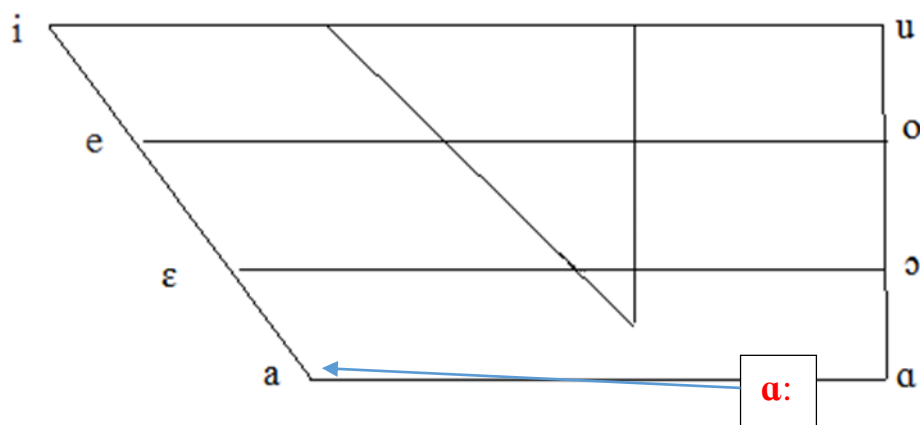


Diagram 6: The English vowel [ɑ:] in the French diagram of vowels.

Heim (2006, p. 77-94, p. 105-107) foresees that the English vowel [ɑ:] would be substituted for the French front open vowel [a], as shown in the Jones diagram, to clarify, the French sound [ɑ] is closer to the English [ɑ:] and should have been a possible substitute, however modern French speakers seem to treat both sounds as one. Casagrande explains that “some phoneticians claim that there are two distinct a’s in French, but evidence from speaker to speaker and sometimes within the speech of a single speaker is too contradictory to give empirical support to this claim”. (1984, p. 20). As a result, French could safely be considered a language containing a singular close [a] sound (Ginésy, 2014, P. 21), as opposed to English which boasts two, the tense vowel [ɑ:] and the lax vowel [æ], and according to CAH, such deficiency could constitute a systematic gap, which in turn makes it more challenging for French natives to distinguish between the two sounds as well as produce them.

4.2.1.5 The sound [æ] as it *cat*

The near-open front unrounded vowel [æ] is situated on the Jones diagram between the French vowels [ɛ] and [a], furthermore “it is clearly more close than the French [a] as in “patte” and it is particularly lengthy and tense for a vowel that is classified among the short and lax vowels.” (Viel, 2003, p. 24).

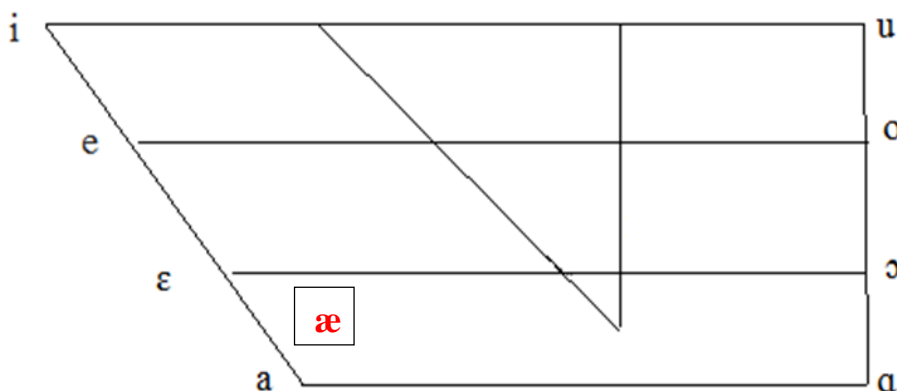


Diagram 7: The English vowel sound [æ] in the French diagram of vowels

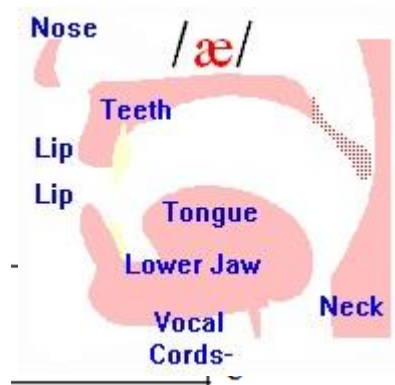
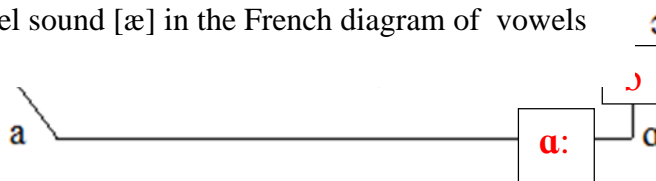


Figure 8: Aperture of the vowel [æ]



The English Diagram 8: The English vowel sound [ɒ] in the French diagram of vowels

The English sound [æ] is systematically different from the English back vowel [ɑ:], as it is almost a frontal vowel that is less tense and lengthy, therefore, its mastery proves to be particularly challenging for natives of languages that do not have more than one [a] sound. In terms of error prediction, Heim (2006, p. 77-94, p. 105-107) suggests that the vowel sound [æ] would be substituted with either one of the front French vowels [a] or [e].

4.2.1.6 The sound [ɒ] as in *dock*

In RP English, the sound [ɒ] is an open back rounded vowel, situated on the Jones diagram, between the French sounds [ɔ] and [ɑ] as in “dogue” and “âne” respectively. However, according to Ginésy (2014, p. 25) the closest sound to it in terms of the place of articulation is the English sound [ɑ:] with the only difference being that the former is rounded and the latter is spread. Moreover, Lily & Viel (1999 p.15) suggest that the English sound [ɒ] is usually shortened and rounded by French native speakers, to the point where it approaches the pronunciation of the French sound [ɔ].

4.2.1.7 The vowel sound [ɔ:] as in *short*

The phoneme [ɔ:] is classified as an open-mid back rounded vowel, despite the fact that it is situated on the Jones diagram between an open-mid and a close-mid position. Furthermore, it diverges from the vowel sound [ɒ] in many respects, mainly:

- It is more open than the [ɒ] sound which makes it closer to the French sound [o] as in “beau”
- It requires more rounding of the lips
- [ɔ:] is tense vowel, which classifies it among the long pure vowels (Ginézy, 2014, p. 25)
- The articulatory organs are in constant motion when producing the sound [ɔ:] (Didier, 1927, P. 99).

When it comes to its relationship with the surrounding French sounds, it tends to be confused with both [ɔ] and [o]. In other words, a native French speaker would produce it either as an open-mid vowel, which is similar to the French [ɔ] sound, or as a close-mid sound that is closer to an [o] sound.

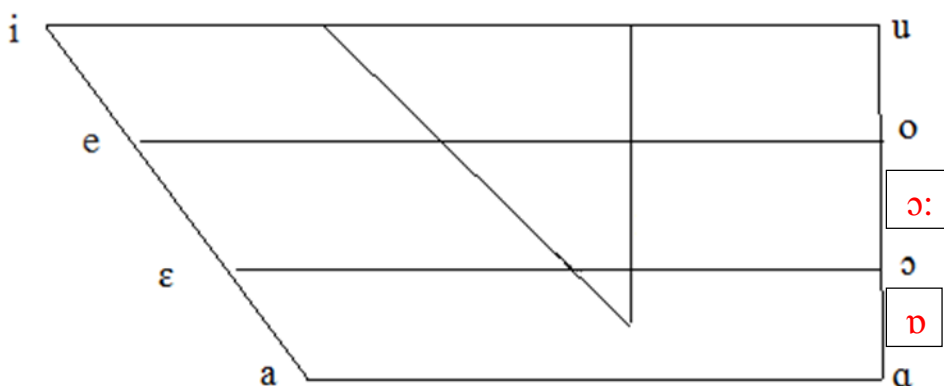


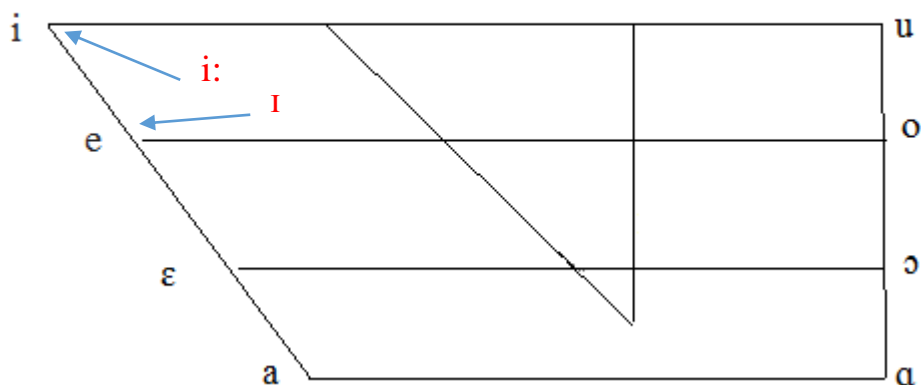
Diagram 9: The English vowel sound [ɔ:] in the French diagram of vowels.

4.2.1.8 The sound [i:] as in *need* and the sound [ɪ] as in *dig*

Two sounds which are sometimes simplified to long [i:] and short [ɪ] because it is commonly believed that their most prominent difference, but not the only one, is the length of their realisations. Moreover, by placing the English [i:] and [ɪ] sounds on the Jones diagram, it

becomes clear that the closest French sounds are either the close front unrounded vowel [i] as in the word *fini* or the close-mid front unrounded vowel [e] as in *beauté*.. Nevertheless, they

Diagram 10: The English vowels [i:] and [ɪ] in the diagram of French vowels.



are less tense, less spread and more central than their French equivalent.

French contains but one close vowel sound [i], this discrepancy could constitute a systematic gap, and thus prove to be challenging for French speakers. Ginésy (2014) states that the vowel [i:] to is a diphthongised vowel that begins with a hint of the short [ɪ] which then devolves into the long [i:] which results in a transcription that reassembles [i:ɪ].

Alternatively, based on the graphic similarities between the two symbols, a French speaker might produce a pure French vowel [i], which is shorter and more tense than the English [i:] but longer than the [ɪ] (Lilly & Viel, 1999, p. 16). Furthermore, the grapheme “i” is never pronounced as [i:] unless in a word of French origin such as ‘automobile, machine, fatigue etc...’. Instead, it is the graphemes “-e, -ea, -ee, -ie etc...” that correspond to the vowel [i:] (Ginésy 2014, p.16). This discrepancy in the English spelling could be the cause of negative transfer considering that “French graphemes representing vowels mainly refer to the same phonemes (Catach, 1986; Véronis, 1986, cited in Sprenger-Charolles, 2003).

4.2.1.9 The sound [ʊ] as in *look*

The near close mid-back rounded vowel [ʊ] is a lax vowel, compared to the tense vowel [u:]. It is adjacent to the French sound [u], yet does not agree with it in every aspect. For instance, the two sounds are back vowels, but the English sound is more centralised to the point where it is closer to the French [o] vowel as in *beau*. Furthermore, the two are rounded vowels, yet the English phoneme requires but a portion of the roundness the French sound

imposes. And lastly the vowel [ʊ] is a near-close sound, which requires the speaker to raise their tongue to the roof of the oral cavity in a manner that almost closes it, whereas the French sound is a close vowel.

In terms of error prediction, French speakers might employ the parameters they have

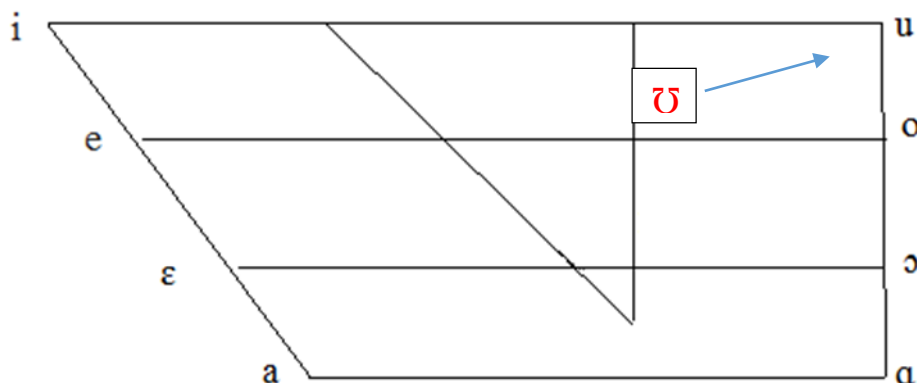


Diagram 11: The English [ʊ] vowel in the diagram of French vowels

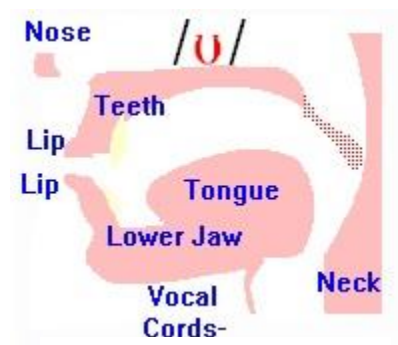


Figure 9: aperture of the vowel [ʊ]

for the French sound [u] (Heim 2006 :77-94; 105-107) to produce the English [ʊ], consequently, it would come out as a rounded close vowel, for instance, the English word “book” would be pronounced as the French word “bouc” (Ginézy, 2014).

4.2.1.10 The vowel [u:] as in *spoon*

The close back rounded vowel [u:] neighbours the French sound [u] as in *loup* which tends to make it the typical substitution (Ginézy, 2014, p28). However, similarly to the other English vowels, the English [u] is more centralised and less rounded than the French [u]. And being a back vowel, French student might to transfer the parameter of rounding of back vowels, to the production of the English [u:].

The vowel sound [u:] is a tense vowel, which makes it relatively lengthier in realisation than the French [u]. Furthermore, Ginézy classifies the sound [u:] as a diphthongised vowel that requires movement throughout its realisation, a criteria that is absent from the French articulation system, and which could constitute a systematic gap.

Overall, based on the comparison above, the vowel sound [u:] is expected to generate negative transfer in the form of sound substitution with the French sound [u]. Heim (2006, p. 77-94, p. 105-107) however, bases his prediction on the graphical similarity between the English sound [u:] and the grapheme “u” such as the segments *duplicate*, *numeral*, *truth*

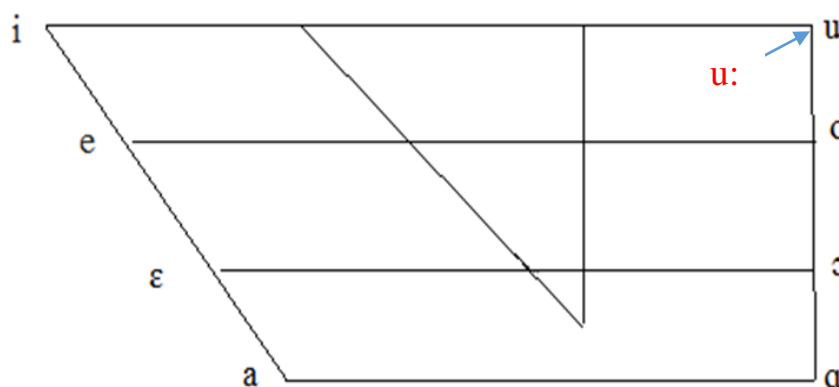


Diagram 12: The English vowel [u:] in the diagram of French vowels

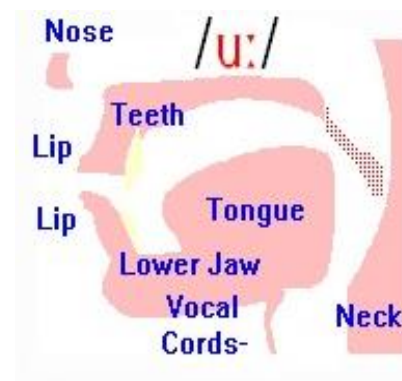


Figure 10: aperture of the vowel [u:]

(Ginésy 2014, p.29). This is backed up by the fact that, unlike English, French vowel graphemes generally correspond to their IPA symbols.

To conclude the section on pure vowels, we could say that, despite the graphical similarities, it has been established that the pure vowels of French are indeed distinct from the monophthongs of English. The modes of articulation in the French pronunciation system set the two assortements of vowels apart, notably, the tense mode prevents the vowels of French from being diphthongised, let alone be diphthongs. Furthermore, the frontal mode establishes most of the French vowels in frontal positions unlike English, where vowels dominate the central zone of the diagram. As a result, these articulatory differences, according to CAH, could generate varying degrees of negative transfer, which if observed to be systematical among experienced learners of English, could be translated to fossilisation. With that in mind, the next section will examine a few English diphthongs, compared to the French vowel system.

4.2.2 Diphthongs

The English inventory of phonemes contains 8 diphthongs [eɪ], [aɪ], [ɔɪ], [əʊ], [aʊ], [ɪə], [eə], and [ʊə]. French on the other hand, is characterised with a rigid mode of articulation, and as a result: “Vowels in Modern French are not diphthongized, nor have they been for quite some time” (Walker, 1984, p. 14). Ginésy defines a diphthong as “a complex sound that functions as a single vocal unit belonging to one syllable. it is a vowel that contains a glide from a relatively precise starting point to a point of destination that is rather elusive” (2014, p. 34). The Inspection of these two properties should provide insight as to the errors diphthongs might incur.

- The unicity of the diphthong

Despite the fact that diphthongs are transcribed into two symbols, such as [aɪ], [eɪ], and [ɔɪ], they may occur in graphemes containing two letters, for example, the word *boat* /bəʊt/, or in graphemes with a single letter such as *old* /əʊld/. They are nevertheless considered as a single phonemic unit.

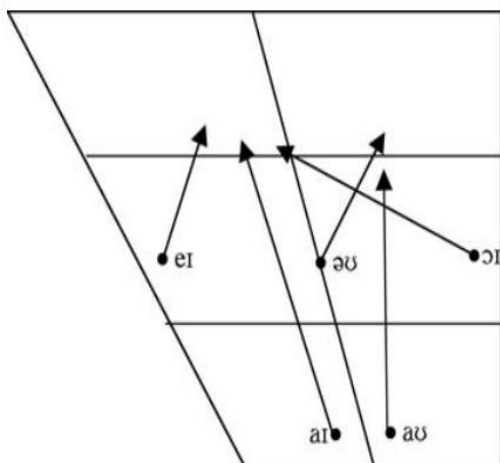


Diagram 13: RP English closing diphthongs (Roach 2004, p.242)

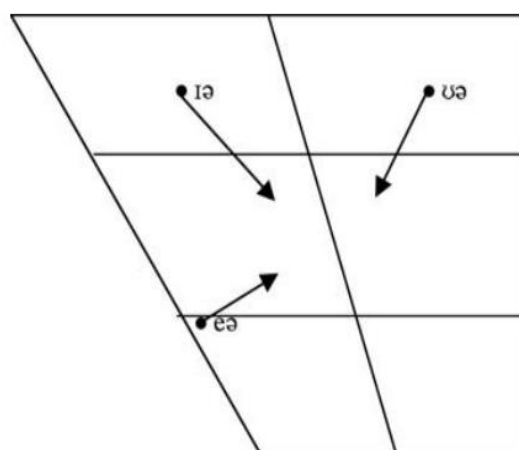


Diagram 14: RP English centering diphthongs (ibid)

- The gliding

A diphthong requires a gliding movement from the place of articulation of its first sound to the general direction of the second. Adding to that, “the two sounds do not have the

same importance: as the first one is more distinct and audible than the second” (Chabert, 2018, p. 19).

The mechanism of gliding between sounds is not part of the French pronunciation system, which makes diphthongs⁹ difficult to perceive for French speakers, let alone produce. As a matter of fact, the closest we can get to a diphthong in modern French is with a sequence containing a vowel followed by semivowel, for instance *ail* /a+j/ (Ginésy, 2014, p. 34). Moreover, Fournier (2010, p. 161) explains that this systematic gap may corner some French speaking EFL learners to consider one of two remedies:

- The distance between the place of articulation of the first part of the diphthong and the second varies greatly, for example, the distance between the vowel sounds [e] and [i] in the diphthong [ei] is remarkably shorter than the length between the beginning and the end of the diphthong [ai] (see diagram 13). Accordingly, French speakers might produce such diphthongs as separate sounds without the gliding, for example pronouncing *buy* as /ba+j/ or *house* as /ha+us/. This is however a beginner’s mistake.
- The prolongation of the closest French equivalent of the diphthong, the similarity is often based on the grapheme rather than phoneme, for example: the diphthong [ei] in “brain” /brein/ would be reduced to [e]. This error could occur even among advanced learners

This next section will examine a few diphthongs and study their relationship with the French sound system, using the Jones diagram, in an attempt to predict errors in the production of sounds.

4.2.2.1 Closing diphthongs

The direction of the gliding is the factor that dictates the categorization of the English diphthongs into either closing or centering diphthongs. The former are diphthongs which move towards the close sounds [i] or [u], hence the name closing diphthongs. These vowel sounds require the longest movement from the first point of articulation to the second (see diagram 13), which manifests as a singular gliding movement without interruption. Hence the tremendous difficulty for French EFL learners with this vowel sounds.

⁹ The French inventory of sounds contained diphthongs in the past, we can see traces of this in words such as “joie” and “huile”(Fournier, 2010 p. 160)

4.2.2.1.1 The diphthong [aʊ] as in *our*

This diphthong begins, in RP English, in the general area of the open front unrounded vowel [a] and moves towards Near-close back rounded vowel [ʊ], and due of the rigidity of the French pronunciation system, it can prove to be challenging for French speakers to know when to put the gliding to a halt, which in turn would result in a movement that extends towards the French [u] sound, if not a pronunciation that is a mere sequencing of the two

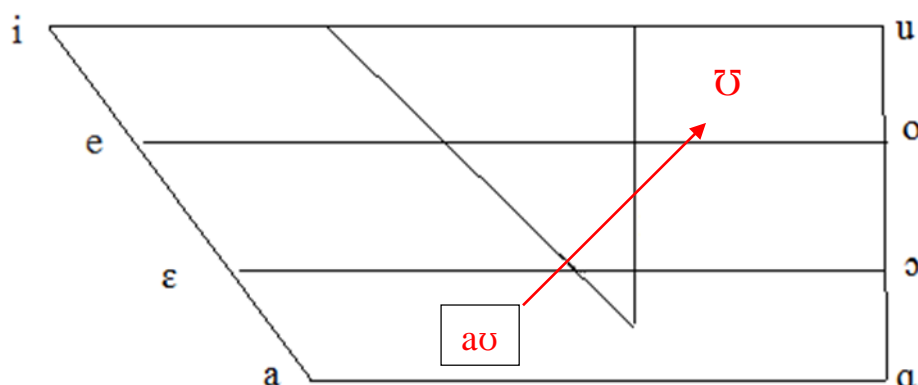


Diagram 15: The diphthong [aʊ] on the French diagram of vowels.

monophthongs [a] and [u]. Fournier and Ginésy (2014) agree that the diphthong [aʊ] is inherently ambiguous for French speakers, as they tend to automatically assimilate it with the French rounded back monophthongs [o] and [ɔ]. Moreover, this diphthong can occur in the grapheme “ou” (Ginésy 2014, p.40), which invites the back vowel [u] in the French pronunciation system. As a result, French speakers might substitute the diphthong [aʊ] for an elongated realisation of the French vowel [u].

4.2.2.1.2 The diphthong [ɛɪ] as in *say*

This diphthong begins at a mid-open frontal place of articulation that is close to the French sounds [e] and [ɛ], which then glides to the mid close position of the [ɪ] vowel. Considering the minimal amount of movement it requires (see diagram 16), the common mispronunciation is to produce this

diphthong as a long [e] sound that is devoid of movement. Additionally, some learners could be compelled by the muscle tension mode of French to produce a sequence of [e] and [j] sounds (Ginésy, 2014, p. 35).

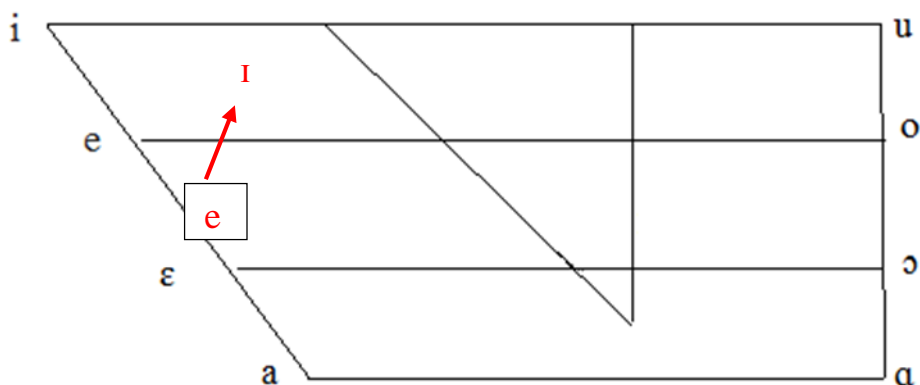


Diagram 16: the diphthong [eɪ] in the diagram of French vowels.

4.2.2.1.3 The diphthong [aɪ] as in *time*

The Jones diagram reveals that despite having the [a] symbol at the beginning, the diphthong [aɪ] commences from a central position that is adjacent to the mid-close sound [ʌ] and progresses upwards towards the mid-open vowel [ɪ] (Ginésy 2014, p. 36). And in accordance with the rest of the diphthongs, its first part carries the most emphasis, with a longer realisation and a more audible pronunciation.

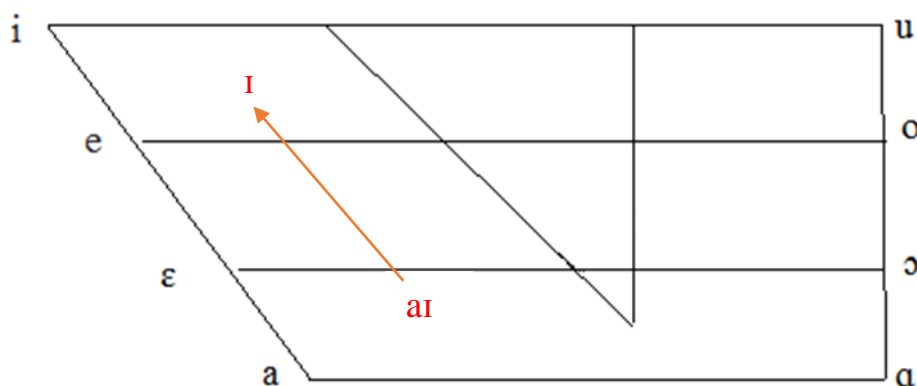


Diagram 17: The diphthong [aɪ] on the diagram of French vowels.

As explained before, the length of the movement between the sounds [a] and [ɪ], could confuse an untrained French speaker into producing this diphthong as two separate sounds. Additionally, considering the fact that this diphthong ends with an [ɪ] sound, the tense mode of articulation of French sounds could lead to a [j] sound.

To conclude, through the Jones diagram, it had become apparent that diphthongs require a great deal of movement and for an accurate realisation. Furthermore, unlike pure vowels, diphthongs do not have a close equivalent in the French inventory of phonemes, and would therefore require ELF learners to perform an articulatory task they are unfamiliar with. As a result, an enormous amount of negative transfer is to be expected from such complex sounds.

The analysis of vowels in this chapter could have been more encompassing as to include closing, as well as, centering diphthongs. Unfortunately, the size limit of this dissertation does not permit such a thorough analysis. Nevertheless, this section has demonstrated, in theory, some effects of the French phonological background on the production of English vowels, which was mostly in the form of interference based on the differences vowels have in both languages. Accordingly, for the study to cover positive transfer as well, we shall move to the description of a selection of English consonants, and the way they compare with the consonants of the French inventory of sounds.

4.3 Consonants

Crystal (2011, p. 103) defines consonants as: “sounds made by a closure or narrowing in the vocal tract so that the airflow is either completely blocked, or so restricted that audible friction is produced. They contrast with vowels in many aspects, namely:

- Air flow: consonants are produced by a blockage of air that is followed by a release which creates a specific sound, plosives are a prime example for consonants. Vowels on the other hand, are continuous, in other words, the length of their realization depends on the amount of air in the lungs of the speaker. Compare the sounds [u] and [p] for example. Repp (1984) writes: “consonants are shorter and perceived more categorically; there is more variability in the production of vowels than of consonants; vowels are often harmonized within words while consonants are not”.
- Voicing: while vowels are voiced, some consonants do not cause a vibration of the vocal cords, such as [t] and [s]

- Manner of articulation: this parameter dictates how the air escapes from the vocal tract during the process of consonant production. It is worth noting that some sounds can display the properties of both categories, such as the semi vowels [j, w, ɥ].

“Consonant articulations are relatively easy to feel, and as a result are most conveniently described in terms of place and manner of articulation” (Crystal, 2011).

Table 2: Consonants of Standard French in comparison to the consonants of RP English

	SF consonants	RP English consonants
Plosives	[p] papa – apprendre [t] table – autour – fête [k] comme - que [b] bien – arbre – robe [d] dans – dire – garder [g] garçon – ogre	[p] pea [t] toe [k] cap [b] bee [d] doe [g] gap
Fricatives	[f] faire – souffrir [v] vent – vous - wagon [s] soleil – instant – fils [z] zoo – maison [ʃ] chemin - dimanche [ʒ] jardin – girafe - rouge [r] rouge – grand – venir	[f] fat [v] vat [s] sip [z] zip [ʃ] ship [ʒ] measure [h] hat [ð] this [θ] thing
Nasals	[m] maison –animal [n] nous – venir - semaine [ɲ] gagner – campagne	[m] map [n] nap [ŋ] hang
Central approximates	(Phonèmes semi consonantiques) [j] soleil – feuille – yeux [w] loin - pingouin [ɥ] huit – lui - nuit	[j] yet [w] wet [ɹ] red
Affricates		[tʃ] chin [dʒ] gin
Lateral approximates	[l] livre – vouloir - cheval	[l] led

Accordingly, the table 2 below, classifies the consonants of French and English based on their manner of articulation, for easier comparison. In that respect, French and English share all the

Stop consonants and employ the same IPA symbol for each, which, according to Equivalence Classification Hypothesis (1987), incorporates them into the category of “similar” sounds from the perspective of the learners. As a result CAH would consider them as sources of positive transfer. Swan (2001, p. 52) also argues that “French speakers do not have great difficulty in perceiving or pronouncing most English consonants”. However, being sounds that belong to different languages signifies that they cannot be absolutely identical. Such points of divergence could be attributed to the pronunciation parameters that set them apart, essentially their places of articulation and the modes articulation which uniquely characterise each of the two languages. Additionally, the two inventories of phonemes contain language specific sounds as well, namely, the consonant sound [ʁ] in French and the [h, ð, θ] in English. This creates a systematic gap according to CAH, and should prove these sounds to be more difficult to acquire than sounds that exist in both languages. In this section we will examine the articulatory differences between the English stops and fricatives and their French counterparts, if any exist, in an attempt to explain positive and negative transfer in the data analysis part of the second chapter.

4.3.1 Plosives

Plosives, also known as occlusives, are “Speech sounds classified according to their manner of articulation, in which at least one closure is formed with the glottis or in the oral cavity” (Bussmann, 2002). The phoneme inventories of French and English contain six common plosive sounds, half of which are voiced, with the other half being voiceless, in that order, the list contains the consonant sounds: [b, d, g] and [p, t, k].

However, despite the apparent similarities between RP and SF plosives, they diverge in some points, mainly:

- Place of articulation:

There is a systematic difference between French and English in regards to the general places of articulation of sounds, as established before, based on Delattre: “all the consonants that involve the tip of the tongue are farther forward in French than in English” (1957, p. 61). Additionally, “in French, at least in the Northern [i.e., standard] pronunciation, one most often presses the tip against the lower teeth and the upper blade against the upper teeth and the gums; it is the blade which closes the passage. In English, one presses the tip against the gums, which produces a sound very noticeably different” (Passy, 1899, p. 97).

- Manner of articulation

The English voiced plosives [b], [g] share their places of articulation with the French equivalents, however they are not completely identical, Didier (1927, p. 189) explains that, English consonants are less tense, as they don't require as much muscle tension as their French equivalents. As a result, [k] and [g] sound slightly softer than the French [k] and [g] which he described to be more "claquant".

- Aspiration

The voiceless stops [p, t, k] are always aspirated in the onset position of a stressed syllable if followed by a vowel (Chabert, 2018, p. 59). This feature is absent from French pronunciation and could therefore constitute a systematic gap.

Overall, Stop consonants do not differ greatly in their realisation between French and English and should therefore generate some amount of positive transfer. However, the subtle differences shown above could potentially remain undetected for learners of English, who might produce English plosives exactly as they would pronounce them in

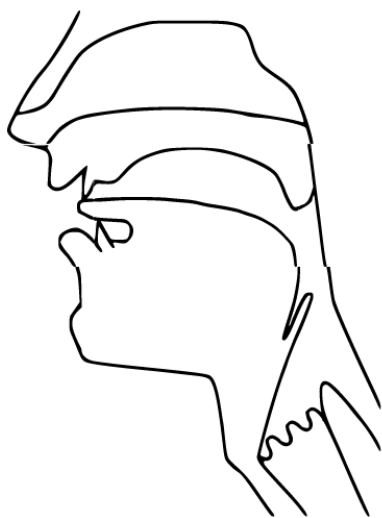


Figure 11: Dental place of articulation of the sound [ð]

French.

4.3.2 Fricatives

"Fricatives are sounds produced when two articulators come into close contact with one another leaving only a narrow passage of air" (Ladefoged, & Maddieson, 1996). This

category contains the highest number of sounds in both languages, the list of common sounds contain [f], [v], [s], [z], [ʃ], [ʒ]. However these sounds do not have the exact same places of articulation in both languages “..... in the consonants [s], [z] [ʃ], [ʒ], the tip of the tongue, instead of turning up, as in English, curves down, leaving to the blade of the tongue the role of providing the channel through which the air passes before hitting the teeth (for [s], [z]) or the alveolar ridge (for [ʃ], [ʒ])” (Delattre p. 61). This could influence the pronunciation of English by native speakers of French as they would automatically place these English fricatives into a more frontal position.

Apart from the six shared fricatives, the inventory of English phonemes contains the sounds [θ], [ð] and [h] which do not exist in the French inventory, and should therefore be problematic. To illustrate, the dental voiced fricative [ð] and dental voiceless fricative [θ], employ a place of articulation that remains unused by any sounds in the French inventory of phonemes, which creates a systematic gap that forces the French speaker to improvise. Ginésy (2014, p. 51) as well as (Heim, 2006 p. 77-94, p. 105-107) predict that the common practice would be to substitute the English voiced sound [ð] with either [z], [d] or [v], and the voiceless sound [θ] would be replaced with either [s], [t], or [f].

The final fricative in this description is the English voiceless glottal sound [h] as in

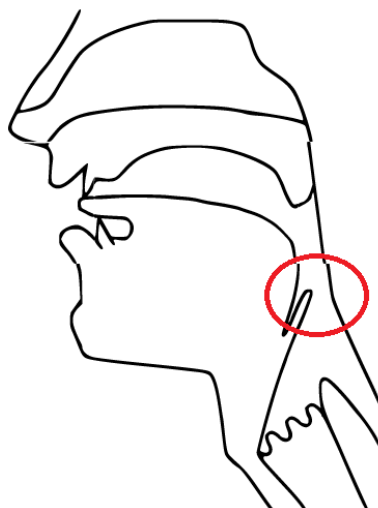


Figure 12: The glottis

“hat”, and although it is classified as a fricative sound, it requires minimum friction, according to Ladefoged (1990) “most forms of [h] have very little friction at the glottis.....the vocal cords are apart and any turbulent airflow that there might be is due to

what Pike (1943) calls ‘cavity friction’ compared to local friction of the other fricatives”. Additionally, “It can be described as a segment whose only consistent feature is its breathy voice phonation in such languages”. Ladefoged & Maddieson (1996, p. 325–326) however Ginésy (2014, p. 51) adds that when it is found in initial stressed syllables, the friction that produces the sound [h] is substantially more noticeable.

The voiceless fricative [h] is produced at the level of the glottis, a place of articulation that does not see much usage in French, except for rare cases such as the exclamatory interjection, “aha” (De Launay, 1993), or in one possible pronunciation of the uncommon verb “ahaner”¹⁰ which means to pant or to breath heavily. Furthermore, in French, the grapheme “h” if not paired with either *c*, *p*, or *t*, has two unpronounced realisations: the silent [h] as in “l’hirondelle” which enforces “linking”, or the aspirated¹¹ [h] as in *le hérisson* which forbids it. In essence the English sound [h] does not exist in the French pronunciation system and is often regarded as a silent vowel. French learners tend to omit it entirely when it is onset position, or forcibly inject it before initial vowels in stressed syllables (Ginésy, 2014, p. 51). Vaissière (2010) writes : “les positions fortes dans le mot sont l’initiale et sous l’accent lexical. Les phonèmes en position forte dans la syllabe sont à l’attaque et la coda est en position faible”. In other words, the [h] insertion might stem from the fact that the typical French stressed syllable starts with a consonant, which is then followed by a vowel, and not the opposite.

The fricative parameter of articulation is indeed part of the French pronunciation system, which should be a facilitating agent for learners faced with fricatives from the English inventory of sounds. However what could generate difficulty is the production of fricatives that require usage of a place of articulation that they are unfamiliar with.

As a whole, consonants are more defined than vowels as they are produced at precise places of articulation and possess fewer pronunciation parameters than vowels¹². Furthermore, the differences between English consonants and their French equivalents pointed out in this

¹⁰ Pronunciation suggested by a French native from the website <https://forvo.com/word/ahaner/>

¹¹ Not to confuse with the aspirated consonants in English, which require an actual aspiration of air. Niklas-Salminen (2012) writes : “ Ce que l’on appelle aujourd’hui un [h] aspiré en français n’est en fait ni un [h], ni aspiré »

¹² The hypothesis that consonants are more accurate in their realisation than vowels can be supported by phoneme acquisition among infants. “Word learning tasks with pairs of words differing by one phoneme reveal that French-learning toddlers are sensitive to consonant but not to vowel contrasts until the age of 30 months” Nazi & al. (2009)

section do not constitute a systematic gap, except for [θ], [ð] and [h], that would cause interference. Therefore, their similarities, would demonstrate the positive effects of cross-linguistic influence.

As a conclusion, this chapter briefly presented the concept of sound transfer and how it evolved through the years of study, while introducing two theories that are crucial to this study: CAH and Interlanguage fossilisation, next it showed the main modes of articulation that set the two languages apart in terms of pronunciation. And lastly, following the guidelines of CAH a modest comparative analysis was performed to highlight the differences and similarities there are between an assortment of English sounds and their French closest equivalents, while attempting each time, to provide a prediction of learner errors.

Chapter two

Practical experiment: a case study of a group of LLCER

M2 students

5. Methodology

This chapter will be presenting the methodology and the development of the experiment that will be demonstrating conducted in this dissertation, and which studies the possible effects of the French phonological background on the phonetic EFL production of student of M2 LLCER.

The use of instrumental analysis in phonetic research is vital, as was mentioned in the early works of Pike, Ralph and Bascum (1959). Baart (2009) claims that: “acoustic phonetics in fieldwork adds accuracy, precision and objectivity, it is useful for ascertaining pitch height and movements, duration and quality of vowels and consonants, measurements of Voice Onset Time (VOT) and syllable length, aspiration, voice quality and phonation”. Accordingly, the participants in this experiment were given a text in English to read before producing an audio recording. The data was then collected and analysed using PRAAT (an audio transcription software). And was in turn studied and compared with a recording containing the same text by a native speaker. The following step was to highlight a number of occurrences of a specific sound, and compare the production of the said sound, by the students, to the pronunciation of the native speaker. This analysis allowed for the detection of errors which will be explained in this chapter in terms of phonological transfer. The experiment focused on the pronunciation of the phonemes described in the previous chapter, while taking into consideration their immediate environment, and the fact that it is a reading exercise. Furthermore, the number of correct realisations or interferences calculated in hope of finding a recurrent behaviour that could hint to a generalization.

5.1 The parameters of the experiment

Several steps of preparation needed to be accomplished before proceeding with the case study. Namely: the level of English proficiency within which transfer would be studied, the type of pronunciation exercise that should be conducted in the experiment, the content of the experiment (in this case, the text to be used) and finally, the tools that would most fit this type of experiment. Each parameter will be explained in this section as well as the reasoning behind the choice.

5.1.1. Language variety

In every phonological comparative study, a single variety of the studied language must be selected as sample. In this respect, RP English will be used in this study because: “RP’s phonetic and phonological details are probably the most well-known and thoroughly-described of any accent variety of English, due to a descriptive history now stretching back

almost one hundred years (Jones 1918, 1932, 1956; Gimson 1962, 1970, 1980; Wells 1982; Cruttenden 1994, 2001)". However, "despite various claims to the effect that the RP accent, form and status have changed so much that the name should be considered obsolete (see, for example, Milroy 2001, Macaulay 1988)". (Fabricius, 2007)

RP for many analysts remains a phonetically, phonologically and sociolinguistically identifiable accent variety (or set of varieties) of (British or English) English. In common with Wells (1982), Cruttenden (2001) and Roach (2004)" (ibid). As for the French variety, Standard French has been selected, considering the fact that the all of the informants in this study come from and reside in Metropolitan France. "The standard for French is based on the dialect of Île de France (technically known as Francien) which has been the official standard language since the mid-16th century (Duffell, 2008)" (cited in Yurtbaşı, 2017, p.32). The comparison will therefore be between the participants' pronunciation of English and the standard RP pronunciation provided by two native speakers.

5.1.2. The level of proficiency

It was crucial to determine the level of English to be studied early on, because this criterion dictates several parameters of the experiment. Expressly, working on a group of beginner level students would certainly allow for the examination of the effects of transfer, because it is a phase of SLA in which learners are still in the process of developing their interlanguage. Consequently, the results could hardly be considered reliable for generalization, as learners at this stage tend to be at the phase of trial and error, which allows them for a greater margin of error. Furthermore, the range of exercises that can be exploited in

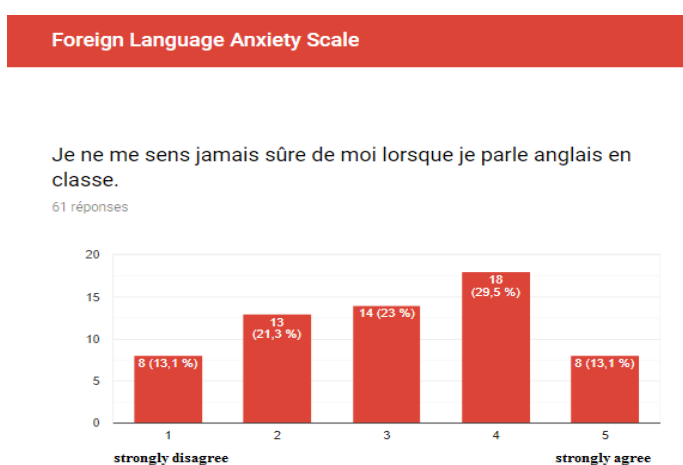


Diagram 18: Advanced learners' attitude towards their EFL proficiency.

beginner level is restricted to what they are used to do in their English training. Advanced students on the other hand should have finalized their phase of learning and would therefore produce phonetic output that can safely be considered as stable and finalized. In addition, the effects of fossilisation do not manifest in a learner before they have reached this stage in their learning process. And lastly, a plethora of experimentation has been performed demonstrating the effects of transfer on young or otherwise beginner level learners. By contrast, not enough experiments have been carried out to elucidate the effects of phonological transfer and Fossilisation on advanced learners. As a result, this dissertation aims to contribute to this field of study.

Advanced learners of English were targeted with for this experiment for reasons relating to their attitude towards their L2 production. A study titled “L’anxiété liée à la prise de parole”¹³ was conducted by McNamara (2018) at Grenoble Alpes university, in which around 60 students took a questionnaire containing inquiries about English as their L2, their language competence, and the way they feel about using English in a classroom. The majority of the participants come from a French origin and have French as an L1, they also have been learning English for at least 8 to 10 years. Furthermore, according to SLA research, it may

Je ne m'inquiète pas de faire des erreurs en cours d'anglais

61 réponses

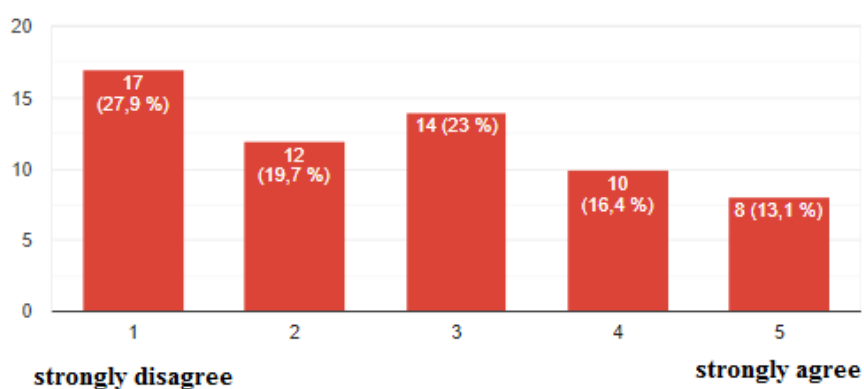


Diagram 19: Advanced learners' attitude towards errors.

take as long as 7 to 10 years for non-native speakers to reach the average level of performance

¹³ Mc namara (2018) L’anxiété liée à la prise de parole
https://docs.google.com/forms/d/e/1FAIpQLSdKMA75a_YhWQhxYvnEjCR7CoW08ypn8lYf85k2GMBO7DDwpQ/viewform

by native speakers on standardized tests. Collier (1987) and Collier & Thomas (1988). With this in mind, it can be safely assumed that these French participants are at an advanced level of proficiency that could label them as bilinguals. However, a closer inspection at the diagrams 18 and 19, shows that a great percentage of advanced EFL learners in Grenoble Alpes University are reluctant to use their L2 in a classroom environment. On a global scale, and according to the English Proficiency Index (EPI), France ranked #35 out of 88 countries, where English is not the national language, in 2018 and #25/32 in Europe. And although this test does not evaluate participants on every aspect of English, it is still clear that French people are less likely to openly speak English and the anxiety related to their language production is at least somehow involved. Furthermore, the informants participating in this study admit that they are not an exception from the above survey, as they consider that having imperfect pronunciation skills is one of the reasons why they would rather not use English outside of a pedagogical environment.

5.1.3 The participants

The experiment presented in this chapter is a case study of a group made up of 6 LLCER M2 students who come from a French speaking background, three females and three males, who belong to the age group (five 20-22 year olds and one over 50 year old), and have admittedly, the same pedagogical background of English learning (around 14 years of English classes), the reason for this choice lie in the fact that “the influence of the mother tongue or other known languages becomes more evident, until, when we are dealing with adults, particularly if they are educated, interference seems to be strongest.” (Corder, 1981, p. 74). In addition they are students who recognize that they may have some room for improvement for their English pronunciation.

Obtaining authentic research materials is instrumental for an accurate and reliable scientific analysis .This was made possible thanks to the participants who were ready and motivated to be part of this experiment. They received the text and the instructions via email before they proceeded to record their pronunciation in their own private space, without any external pressure that might influence the output. As for the native speakers participating in this study, the same data collection method was employed, and the recorded data of the two English natives was used as reference of the pronunciation of RP English.

5.1.4 Pronunciation exercises

Selecting the most efficient pronunciation exercise is crucial to this study as it decides what aspects of pronunciation to be covered, as well as the tools to be used to analyse the data.

Reading aloud is one of the most widely used pronunciation drills, it is practical for both first language and second language learning, it provides great control because the students can show their current pronunciation skills in a clear and measurable way, which makes it suitable with this experiment. According to Madsen (1983, p. 66), three points should be kept in mind:

- When using lists of sentences, evaluate only one or two points per sentence;
- Use natural language
- Avoid signalling to the student which pronunciation point you are testing.

It was crucial for this experiment to select a text that is of sufficient length, to ensure that the phonemes selected in the study would occur in multiple sentences, so as to eliminate the need to evaluate more than one phoneme per sentence. Furthermore, the fact that the excerpt contains a meagre percentage of invented words, is not an indicator that it does not employ natural language, since it is from a renowned literary work. Lastly, the specifications of the study were kept from the participants as they were told to read as naturally as possible.

The only downside for a researcher in pronunciation is that the skill of reading aloud is different from the conversation skill, which makes the participants in a reading aloud drill pronounce their words in narrative and unnatural manner, that could be less authentic than the pronunciation they would use in a situation where they can produce their own sentences. However, the text used in this experiment contains dialogue with questions and exclamatory sentences, which should encourage the participants to utter the sentences in a manner that is close to real life speech. Furthermore, this study examines the production of phonemes which should remain consistent between reading and speaking.

Widodo (2009) argues that it is very important for a successful reading aloud exercise to pay attention to 5 criteria but in this experiment only a few of them are needed:

A- Choosing suitable and interesting texts:

The text chosen for this experiment is from a renowned comedy science fiction trilogy the Hitchhiker's Guide to the Galaxy (1980) by Douglas Adams. This short story was adapted into a TV series as well as two video games. Conversely, the success of franchise stems from its

ability to bring out the humorous effect of storytelling by subverting expectation and using clever play on words while telling a fantastic story, making it an excellent choice for this experiment.

B- Selecting and sequencing reading tasks to develop students' reading skills: In this experiment, the focus will not be on the participants' ability to narrate a text with fluidity. What will be more interesting for this dissertation is to organize a reading task with sufficient instances of the selected phonemes, to enable the implementation a modest quantitative study.

C- Giving guidance for and facilitating pre-, while-, and post-reading activities: to ensure an optimal output regarding the authenticity of the language and a faultless development of the experiment, participants were given but a few instructions: firstly they were informed that they were not taking part in a reading exercise that would evaluate their reading, to minimize any anxiety or self-doubt they may have towards their reading skills, which might negatively impact the output. Secondly, participants were given the option of recording their performance at their own private time and place. Removing the examiner would ensure that the students are most comfortable with their skills, which guarantees an optimal and stress free output. Thirdly, students were encouraged to read the text silently multiple times if necessary, as the goal is not to surprise them with tongue twisters, but rather to observe their pronunciation. Fourthly, students were promised that their role in this experiment will remain anonymous and that the data will be destroyed at the end of this work. As a result they will be labelled as participants A to F in this dissertation. Lastly, the informants were reassured that their reading mistakes will be overlooked, because only a few interesting segments of the audio will be selected for study. This should eliminate the stress related to providing a faultless recording.

D- Encouraging students to get involved in group activities: The most efficient way to encourage students to participate in group activities is to announce to them that another familiar group is currently participating in the same activity. This psychological phenomenon is referred to as 'Crowd psychology' and was popularized by Sigmund Freud in his work *Group Psychology and the Analysis of the Ego* (1921). This technique could be applied to any other group activity, and was certainly useful in increasing the number of participants in this experiment.

E- Providing scaffolding for reading activities: this was very important for this work because it is an activity that is very sensitive to stress, in other words, students were given enough preparation time and were not left without any instruction for the purpose of putting them at ease towards this activity. However they were not told which aspects of pronunciation

will be focused, to maximize the effort they will put into this work and to make sure they do not concentrate on some parts while ignoring some others.

5.1.5 Presentation of the text

“Choosing appropriate texts is one of the important decisions a reading teacher needs to make” (Lindsay & Knight, 2006). *The Restaurant at the End of the Universe* by Douglas Adams was selected as a source for the text that served as a pronunciation exercise for this experiment, from which pages 7, 8, and 9 were singled out. Furthermore, the first two pages consist of narration with sentences of varying length, while the rest of the excerpt is composed of dialogues. It is important to note that the short story at hand belongs to the science fiction genre, which means that various imaginary/invented words could be found within, such as the words “Vogon, Prostetnic, Hyperspace, Jeltz,” and naturally, the pronunciation of segments of this nature will not be analysed. Furthermore, it was imperative for the text to be of sufficient length for two reasons. Firstly to provide at least ten instances of each of the sounds that will be studied, in order to insure that the observed data will amount to a modest quantitative study. And secondly, to supply the study with a variety of words ranging from common words that the students have encountered countless times, to infrequent words that would ensure a balanced assortment of segments in terms of word rarity.

For the sake of wisely utilising the limited size of this dissertation, only a portion of the text will be exhibited in this section:

“Chapter 1

.....In seeking so implacably the destruction of the Earth and all that therein lay he was moving somewhat above and beyond the call of his professional duty. There was even some doubt as to whether the said bypass was actually going to be built, but the matter had been glossed over. He grunted a repellent grunt of satisfaction. “Computer,” he croaked, “get me my brain care specialist on the line.” Within a few seconds the face of Gag Halfgrunt appeared on the screen, smiling the smile of a man who knew he was ten light years away from the Vogon face he was looking at. Mixed up somewhere in the smile was a glint of irony too. Though the Vogon persistently referred to him as “my private brain care specialist”, there was not a lot of brain to take care of, and it was in fact Halfgrunt who was employing the Vogon. He was paying him an awful lot of money to do some very dirty work. As one of the Galaxy's most prominent and successful psychiatrists, he and a consortium of his colleagues were quite prepared to spend an awful lot of money when it seemed that the entire future of psychiatry might be at stake.

"Well," he said, hello my Captain of Vogons Prostetnic, and how are we feeling today?" The Vogon captain told him that in the last few hours he had wiped out nearly half his crew in a disciplinary exercise. Halfrunt's smile did not flicker for an instant.

"Well," he said, I think this is perfectly normal behaviour for a Vogon, you know? The natural and healthy channelling of the aggressive instincts into acts of senseless violence."

"That," rumbled the Vogon, "is what you always say."

Well again," said Halfrunt, I think that this is perfectly normal behaviour for a psychiatrist. Good. We are clearly both very well adjusted in our mental attitudes today. Now tell me, what news of the mission?"

"We have located the ship."

"Wonderful," said Halfrunt, wonderful! and the occupants?"

"The Earthman is there."

"Excellent! And ...?"

"A female from the same planet. They are the last."

"Good, good," beamed Halfrunt, "Who else?"

"The man Prefect."

"Yes?"

"And Zaphod Beeblebrox."

For an instant Halfrunt's smile flickered.

"Ah yes," he said, "I had been expecting this. It is most regrettable."

"A personal friend?" inquired the Vogon, who had heard the expression somewhere once and decided to try it out.

"Ah, no," said Halfrunt, "in my profession you know, we do not make personal friends."

"Ah," grunted the Vogon, "professional detachment."

"No," said Halfrunt cheerfully, "we just don't have the knack."

He paused. His mouth continued to smile, but his eyes frowned slightly.

"But Beeblebrox, you know," he said, "He is one of my most profitable clients. He had personality problems beyond the dreams of analysts."

He toyed with this thought a little before reluctantly dismissing it.

"Still," he said, "you are ready for your task?"

"Yes."

"Good. Destroy the ship immediately."

"What about Beeblebrox?"

"Well," said Halfrunt brightly, "Zaphod's just this guy, you know?"

He vanished from the screen. The Vogon Captain pressed a communicator button which connected him with the remains of his crew.

“Attack,” he said.

At that precise moment Zaphod Beeblebrox was in his cabin swearing very loudly. Two hours ago, he had said that they would go for a quick bite at the Restaurant at the End of the Universe, whereupon he had had a blazing row with the ship's computer and stormed off to his cabin shouting that he would work out the Improbability factors with a pencil.

The Heart of Gold's Improbability Drive made it the most powerful and unpredictable ship in existence. There was nothing it couldn't do, provided you knew exactly how improbable it was that the thing you wanted it to do would ever happen.”

5.1.6 Pronunciation assessment methodology

As established in the first chapter, this experiment employed CAH, which systematically compares the students' L1 with their L2 in order to attempt to predict errors. The next step was to compare their performance with that of a native speaker, Corder (1975) explains: “the important thing to note is that we identify or detect his error by comparing what he actually said with what he ought to have said to express what he intended to express. In other words, we compare his erroneous utterance with what a native speaker would have said to express that meaning...”

In the field of pronunciation assessment two major techniques are used by most scholars; the holistic approach where: “examiners are asked not to pay too much attention to any one aspect of a candidate's performance, but rather to judge its overall effectiveness.” (Alderson, Wall & Clapham, 1996, p. 289). And the Atomistic approach which requires “a detailed marking scheme in which specific aspects of pronunciation are evaluated separately” (Sebestova, 2007, p. 19). It was imperative to adopt the atomistic approach, considering that the experiment conducted in this dissertation focuses on the pronunciation of an assortment Phonemes. Particularly, for vowels, the selection must include at least 10 segments from the text containing the selected sounds, before listening to segments and comparing them with the natives' pronunciation. The case of consonants however is different, as they are more frequent than vowels and constitute less of a challenge to learners. Accordingly the sum of the selected consonant was calculated, and then examined for errors which are then classified by type. In other words, vowels are delicate sounds with multiple graphemes and will therefore be examined individually, whereas consonants occur in abundance, hence their assessment in bulk.

Pronunciation assessment entails the study of errors, in this regard, it is crucial to define what ‘error’ is, as opposed to ‘mistake’, Corder (1967) states that the former are: “systematic errors of the learner from which we are able to reconstruct his knowledge of the language”, while mistakes are merely “slips of the tongue or pen” (Corder, 1981). In other words, errors are inaccuracies that could be traced back to the learner’s linguistic knowledge, thus they may be measured and used to evaluate their language proficiency. Mistakes on the other hand, are affected by the learner’s attitude, social anxiety, or overall lack of focus.

5.1.7 Tools of data treatment

The data collected for this experiment came in the form of audio recordings which called for the use of several data treatment computer programs. This section will be briefly presented in this section:

- The audio converter:

Audio recording software used nowadays, produce files in the MPEG-4 (.m4a) format, which constitutes a problem, since audio transcription software only supports the universal mp3 format. Consequently, the use of audio converting software was required to proceed with the data treatment phase and VLC media player¹⁴ was selected for this operation. VLC is a free and open source cross-platform multimedia player and framework, that plays most multimedia files and is equipped with a tool that converts m4a files into mp3 files while maintaining the highest possible sound quality.

- Audio transcription software :

Paul Boersma is a professor of Phonetic Sciences at the University of Amsterdam, who developed the software PRAAT¹⁵, a computer program used for analysing, synthesizing, and manipulating speech. The advantages it boasts are numerous, including: easy audio transcription into phonetic alphabet form, spectrogram display, and the most accurate pitch analysis algorithm in the world.

- Graphs

The transcription of the statistical results obtained from the experiment, into visual data, required the use of graphs such as pie charts and bar charts. For this purpose the free to use website onlinecharttool.com was utilized to produce the variety of figures in this chapter.

¹⁴ Official website for the software <https://www.videolan.org/vlc/index.html>

¹⁵ Paul Boersma & David Weenink (2018) Praat: doing phonetics by computer [Computer program]. Version 6.0.37, retrieved 14 March 2018 from <http://www.praat.org/>.

- The website tophonetics.com is an online converter of English text to IPA phonetic transcription that was used in this experiment for various transcriptions.

To conclude, this section has presented a step by step progression of the experiment conducted in this chapter, furthermore it details its parameters and content while justifying the choices for each, before briefly presenting the tools used to facilitate the endeavour. The next section will present results of the experiment as well as a brief discussion in an attempt to explain such findings.

6. The results

This section will present sounds following the same order in which they were described in the first chapter, they will be organised into their respective phonetic categories before being analysed separately, thus, starting with pure vowels, and ending with the fricative consonants.

6.1 Vowels

“We recognize that English spelling is not sufficiently simple and not sufficiently consistent to be a guide to pronunciation...” (1972, p. 2). Particularly, vowel sounds rarely correspond to their graphemes. In other words, an English vowel letter can be transcribed as more than one IPA symbol. This rendered the sound selection process more challenging than expected. It is for this reason, that an assortment of 10 segments will be analysed for each vowel sound.

6.1.1 Pure vowels

This section will display the results of the pronunciation of the pure vowels: [ə], [e], [ʌ], [ɑ:], [æ], [ɒ], [ɔ:], [i:], [ɪ], [ʊ], and [u:] in at least one of their corresponding graphemes. However, due to the limited size of the text used for the experiment, only a few vowels will be analysed with multiple graphemes.

6.1.1.1 The vowel sound [ə]

The central vowel [ə] can be transcribed from the letters “a, e, i, o, u” as long as they are located in an unstressed syllable (Ginésy, 2014, p. 33). In this respect, it was imperative to select a variety of instances of the sound [ə] so as to obtain results that could be comprehensive, at least to some extent. Adding to that, there is a possibility that participants would struggle pronouncing a specific grapheme, and yet exhibit better mastery of the sound in another.

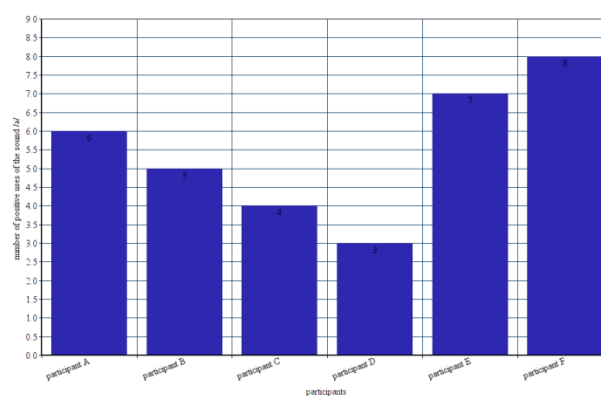
6.1.1.1.1 The vowel sound [ə] with the grapheme *o*

The selected segments for this vowel sound are as follows:

{ *congealed* /kən'dʒi:ld /, *originally* /ə'ri:dʒɪnəli/, *technology* /tek'nɒlədʒi/, *police* /pə'li:s/,
corruption /kə'rʌpʃən/, *professional* /prə'feʃənəl/, *computer* /kəm'pjʊ:tə/ *seconds* /'sekəndz/,
today /tə'deɪ/, *continued* /kən'tɪnju:d/. }

When presented with segments containing the central vowel [ə] the six participants have showed average¹⁶ rates of correct usage of the English schwa., In addition, a slight rounding of the lips was detected as well as a meager pushing of the vowel to a more frontal position in those correct cases, which indicates that the production of the schwa still constitutes a difficulty for French students. However 10 out 60 instances were marked with an excessive rounding of the lips as well as a frontal pronunciation, that the sound produced was closer to a French [œ] as predicted by the Comparative Analysis, because of the systematic gap in the central position of the French articulation system, participants were compelled to seek the closest sound in the diagram. For instance, we have registered a small number of cases in which the students substituted the French front vowel sound [a] for the schwa in the segment *technology*.

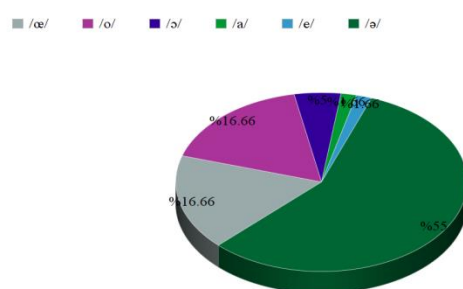
Diagram 20: Correct realisations of the vowel sound [ə] with the grapheme *o*



¹⁶ The word 'average' here is used loosely to represent an average score of correct realisations out of ten segments studied. It does not represent an actual universal average. Additionally 'correct realisations' pronunciations of the vowel that are either accurate or contain a minute degree of influenced pronunciation.

Additionally, bearing in mind the fact that French is a stress timed language which does not neutralize the pronunciation of unstressed vowels, we should attribute the rounded productions of the grapheme *o* to the transfer of the French pronunciation rules of the same grapheme, as it does not have a realization that is unrounded (Didier, 1927, p. 94-96). To illustrate, the segment that was most problematic for the participants is *police* /pə'li:s/, as they substituted the rounded back vowel [ɔ] for the schwa, and pronounced it in a manner that is similar to the pronunciation of the French cognate. Adding to that, for an unstressed sound like the schwa, there were cases where the sound substitutions, such as the front mid close vowel [e] or the open sound [a], were excessively stressed as in the segment *technology* /tɛk'nælədʒi/.

Diagram 21: Pronunciation of the vowel sound [ə] and alternative sounds with the grapheme *o*



Overall, the production of the English sound [ə], being heavily reliant on syllable stress, as well as being a systematic gap, remains somewhat elusive to advanced learners. The grapheme *o* generated transfer of the French pronunciation rules which could safely be considered as fossilisation processes.

6.1.1.1.2 The vowel sound [ə] with the grapheme *a*

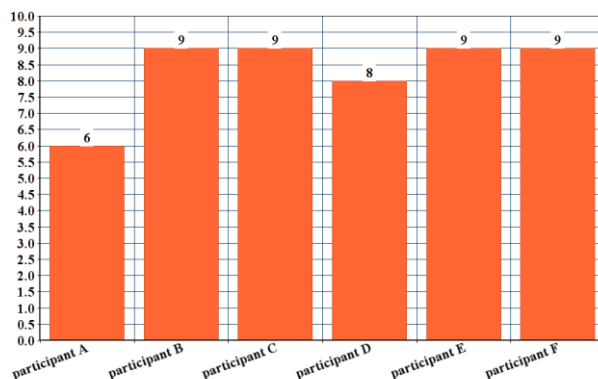
The selected segments are as follows

{*normal* /'nɔrmə/, *natural* /'nætʃrəl/, *anatomical* /,ænə'tɒmɪkəl/, *Analysis* ə'næləsis/,
instant /'ɪnstənt /, *generally* /'dʒenərəli/, *particularly* /pə'tɪkjələli/, *galactic* /gə'læktɪk/,
revolutionary /,revə'lʊ:ʃnəri/, *occupants* /'ɒkjəpənts/.}

The results of this observation demonstrate the students are able to effectively reduce the syllable containing the schwa in this environment, to produce a sound that is close to [ə] at

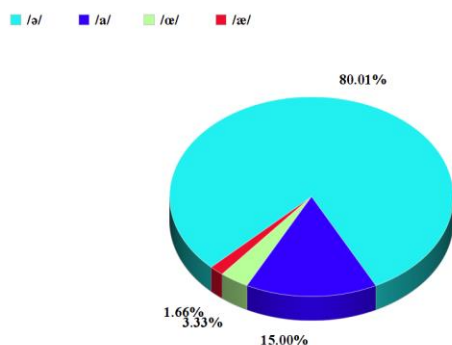
best. As they pronounced it with a degree of spread that drags it closer to the frontal mid close position of the French sound [a].

Diagram 22: Correct realisations of the vowel sound [ə] with the grapheme *a*



The segment that bore the most substantial amount of negative transfer is the word *galactic* /gə'ləktɪk/. Considering that 100% of the participants produced a spread [a] sound, similar to the pronunciation of the French word *galactique*. This leads to the conclusion that, in similar environments, French students would unconsciously favour the front vowel [a] to the central vowel [ə], due to their French frontal mode of articulation. Additionally, this specific error could be regarded as a fossilised pronunciation, which requires specific pronunciation treatment. Furthermore, the segment that did not suffer any influenced pronunciation, in regards to the schwa, is the word *instant* /'ɪnstənt/. Which when compared to the French cognate *instant* /ɛ̃stɑ̃/ does not share its pronunciation. This could lead to the conclusion that French students do not transfer the pronunciation of segments as a whole, but that of patterns.

Diagram 22: Pronunciation of the vowel sound [ə] and alternative sounds with the grapheme *a*



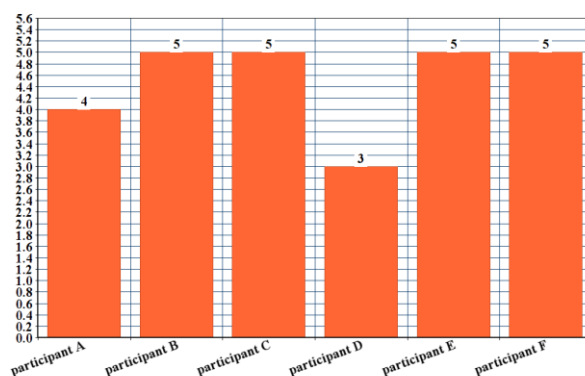
Overall, the participants showed great mastery the sound [ə] in this environment, all the cases of errors, however slight, contained sound substitutions with frontal sounds, which could be attributed to the frontal mode of pronunciation that characterises the French language.

6.1.1.1.3 The vowel sound [ə] with the grapheme *i*

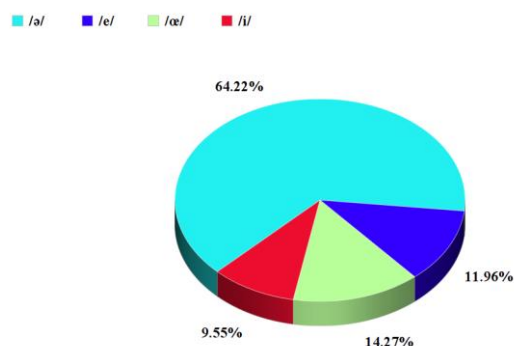
The selected segments in the text are as follows:

{*Impossible* /ɪm'pɒsəbl/, *council* /'kaʊnsəl/, *corruption* /kə'rʌpʃən/ *dictionary* /'dɪkʃənəri/, *destruction* /dɪs'trʌkʃən/, *satisfaction* /sætɪs'fækʃən/, *professional* /prə'feʃənəl/. }

Diagram 23: Correct realisations of the vowel sound [ə] with the grapheme *i*



The results reveal that the participants produced the sound [ə] with the graphemes “-tion, -ssion” with adequate accuracy. The high frequency of occurrence of the two suffixes in the English language might have reinforced their pronunciation among the students. In 14% of the cases however the schwa was pushed to a more frontal position, which resulted in an open sound that is similar to the French [œ]. This substitution could be attributed to the fact that the French sound system lacks a central vowel, and that the frontal mode pushes most vowel to frontal positions. Additionally, The graphemes “-ci, -si” were the source of a higher rates of error among the participants, the graphic similarity with the vowel sound [i], deluded them into producing it instead of the schwa in the segment *council*. Whereas the segment *impossible* incurred a sound substitution for the French vowel [e], which is expected, considering that both sounds are more anterior than the English [ə] sound.

Diagram 24: Pronunciation of the vowel sound [ə] and alternative sounds with the grapheme *i*

To conclude, the production of the schwa in the environments, which invite the unrounded vowel sound [i] in French, is undoubtedly a challenging task that could induce considerable amounts of error among advanced learners. Mainly because the rules of vowel reduction of English do not exist in French, and that the central position in the Jones diagram remain mostly vacant in French. In addition, such distributional errors could safely be considered fossilisations considering the level of the learners, as opposed to the elementariness of the errors.

6.1.1.1.4 The vowel sound [ə] with the grapheme e

The grapheme [e] is the most common occurrence for the sound [ə] in the text, and the selected segments are the following:

{ *excellent* /'eksələnt/, *president* /'prezɪdənt/, *currently* /'kʌrəntli/, *stolen* /'stəʊlənt/, *bribery* /'braɪbəri/, *problems* /'prɒbləmz/, *prominent* /'prɒmɪnənt/, *exercise* /'eksəsaɪz/, *existence* /ɪg'zɪstəns/, *moment* /'mɒmənt/, *happen* /'hæpən/. }

The spelling *e* produced the highest rate of accurate pronunciation of the sound [ə] by the participants. And the few segments which resulted in a French [e] sound by two of the participants, are the cognates *excellent* and *president* which employ the French unrounded vowel sound.

Diagram 25: Correct realisations of the vowel sound [ə] with the grapheme *e*

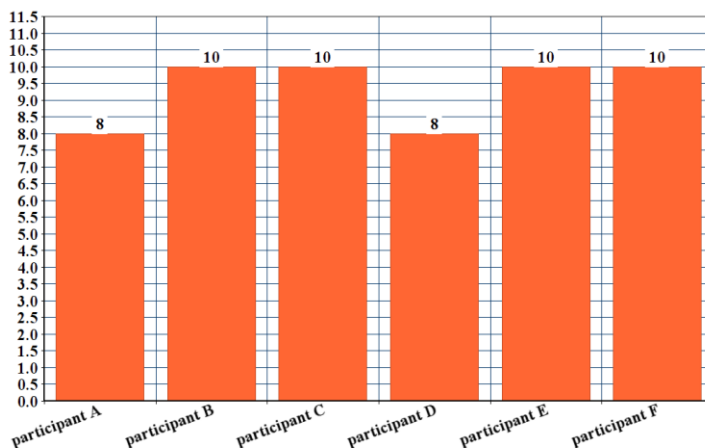
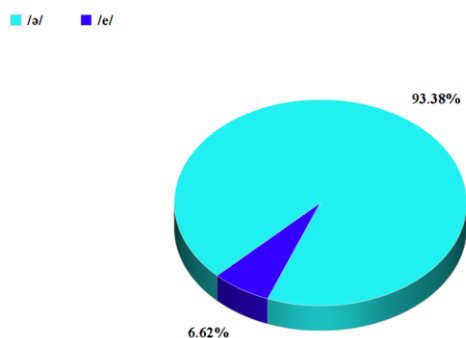


Diagram 26: Pronunciation of the vowel sound [ə] and alternative sounds with the grapheme *e*



As a conclusion, the schwa is a lax neutral vowel that can replace almost any vowel in an unstressed position. It was referred to as a “maverick” vowel by Brown (1990), which could be understood as an element that does not conform to norms of the system. The experiment show that French students have not fully acquired the sound schwa, seeing that it is a systematic gap. The amount of errors recoded in this section was due to sound transfer for the most part, while the rest are overgeneralisations of distributional rules of pronunciation.

6.1.1.2 The vowel sound [e]

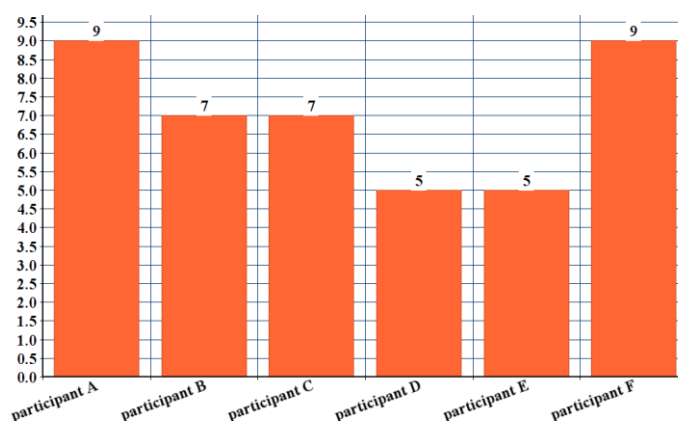
Despite the graphic similarity with the French [e], the English vowel sound [e] is more central. It is usually associated with the graphemes “e, –ea” (Ginésy 2014, p.20) which will be presented in this section.

6.1.1.2.1 The vowel sound [e] the in the grapheme e

The most common grapheme for the mid-close unrounded sound [e] is the grapheme within stressed syllables in the beginning or the middle of words (ibid), the selected segments for this analysis are as follow:

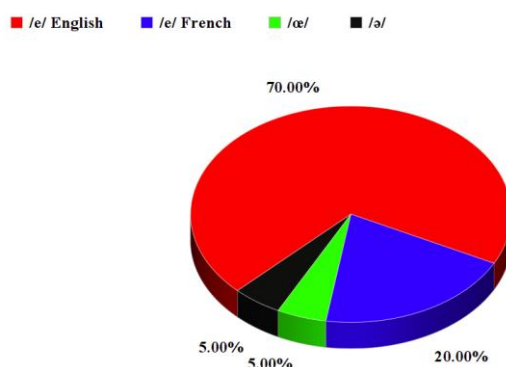
{*yellow* /'jɛləʊ/, *integrity* /ɪn'tɛgrɪti/, *getting* /'gɛtɪŋ/, *very* /'vɛri/, *technology* /tɛk'nɒlədʒi/,
specialist /'spɛʃəlɪst/, *president* /'prezɪdənt/, *ever* /'ɛvə/, *seconds* /'sɛkəndz, /, *excellent*
 /'ɛksələnt/.}

Diagram 27: Correct realisations of the vowel sound [e] with the grapheme e



The production of the sound [e] does not seem to constitute major difficulty for the participants, as demonstrated in the bar chart above. However, the observations registered that in 25% of the cases, they displace the English sound [e] closer to the French sound [e] while attributing more spread to it. This was especially true in the segments *excellent* and *specialist*. The influenced pronunciation of these two segments could be attributed to the fact that the French pronunciation system favour more frontal places of articulation, which pushed the resonance chamber towards the anterior of the oral cavity. The same could be said about the substitution of the vowel sound [œ] for the [e], apart from the fact that this case was marked with an excessive degree of rounding of the lips.

Diagram 28: Pronunciation of the vowel sound [e] and alternative sounds with the grapheme *e*



The sound [e] being a ‘similar’ sound may have confused French speakers into producing it using some of the parameters of pronunciation of the French equivalent in similar environments.

6.1.1.2.2 The vowel sound [e] in the grapheme “-ea”

The grapheme “ea” is generally associated with the sound [i:] in English in words such as *reason* and *sea* however, there are cases where the sound [e] corresponds to the spelling *ea* (Ginésy, 2014, p. 16). The text selected for this experiment contained the segments *unpleasant* /ʌn'pleznt/ and *healthy* /'heθi/. In which three participants overgeneralised the English rules of pronunciation of the grapheme -ea into the pronunciation of the first segment, and produced what could be transcribed as /ʌn'pli:znt/. Incidentally, this did not apply to the segment *healthy*, in which the vowel [e] was produced with greater accuracy. We might speculate that the second segment was produced correctly, because there is no discrepancy between the pronunciation of the grapheme ea in the words *healthy*/'heθi/ and *unhealthy*/ʌn'heθi/. On the other hand, the faulty pronunciation of the first segment is an over-generalisation of the rules of pronunciation of the grapheme -ea in the English word *please* /pli:z/ unto the pronunciation of *unpleasant*. However, the text lacks a sufficient number of examples for us to carry out a comprehensive study.

All in all, the vowel sound [e] caused a small amount of negative transfer that fell in the scope of the predictions we suggested in the first part, which could be attributed to the proximity of the English vowel [e] from its French counterpart. However, this proximity did not generate positive transfer as the two sounds are unique based on the description established before.

6.1.1.3 The vowel sound [ʌ]

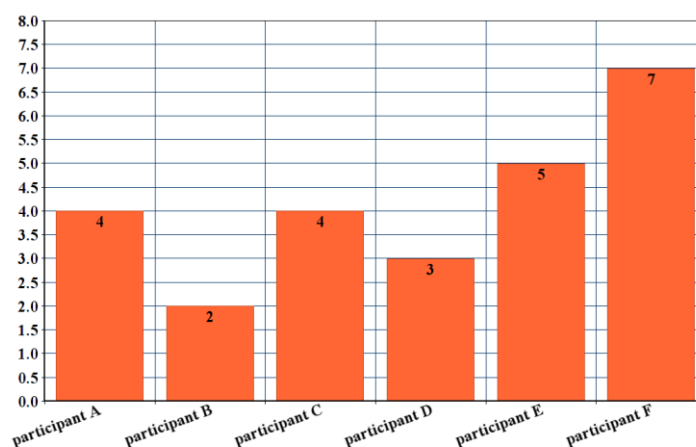
Based on Comparative Analysis, it was concluded that the strut occupies a central position on Jones diagram, and thus, constitutes a systematic gap for French natives, and would therefore trigger negative transfer in the form of sound substitution with the front [œ].

6.1.1.3.1 The vowel sound [ʌ] with the grapheme *u*

The selected segments are the following:

{*much* /mʌtʃ/, *lumps* /lʌmps/, *uglier* /'ʌɡliə/, *cut* /kʌt/, *destruction* /dɪs'trʌkʃən/, *just* /dʒʌst/,
slug-brained /slʌg-breɪnd/, *grunt* /ɡrʌnt/, *reluctantly* /rɪ'lʌktəntli/. }

Diagram 29: Correct realisations of the vowel sound [ʌ] with the grapheme *u*



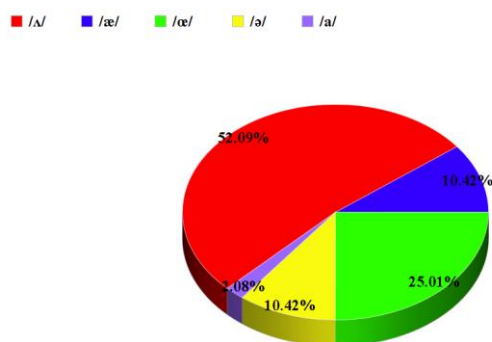
The results show that most participants struggle with the production the vowel sound [ʌ]. Expressly, it has generated the highest amounts of errors of all vowels, which matches Fournier’s prediction of it being the most troublesome sound for French speakers

The selected segments play a role in demonstrating the effects of transfer and fossilisation. To begin with, the segments, *uglier* and *cut*, are fairly common occurrences in the English language¹⁷. As a result, advanced learners are expected to have encountered them more than a few times, and yet it was observed that they generated a great deal of interference. Precisely: 2 accurate realisations of the sound [ʌ] out of 12. The rest are substitutions with the front sound [œ] which is due the French frontal mode of pronunciation.

¹⁷ Word rarity was checked using <https://datayze.com/word-analyzer.php> which a website that utilises “Stemming” as a way to identify the morphological root form of a word.

Similarly, there were cases where the strut was substituted with the open sounds [a] and [æ] in the segments *cut*, *reluctantly*, and *rumbled*.

Diagram 30: Pronunciation of the vowel sound [ʌ] and alternative sounds with the grapheme u



6.1.1.3.2 The vowel sound [ʌ] in the grapheme [o]

In RP English, certain words that contain the grapheme [o] are pronounced with a [ʌ] sound (Ginésy, p. 31). However, in French, the grapheme [o] is almost entirely associated with a rounded back vowel such as [o] or [ɔ]. It should therefore be challenging for the participants to produce the central mid close sound [ʌ] in such a grapheme.

The selected segments available are as follows:

{*something* /'sʌmθɪŋ/, *nothing* /'nʌθɪŋ/, *above* /ə'bʌv/, *money* /'mʌni/, *wonderful* /'wʌndəfʊl/}

The results of this experiment show 18/30 instances in which students correctly employed the sound [ʌ], despite the fact a slight rounding of the lips was detected in most of the cases. The rest of the cases however consisted of substitutions of the [ʌ] with a sound that is closer to the back vowel [ɔ]. Arguably, the participants overgeneralised the rules of pronunciation of the grapheme [o] in French to the pronunciation of English. Furthermore, the segments that incurred the most interference are the common words *money* and *wonderful*, which could hint that these are cases of fossilisation.

The central position of vowel sound [ʌ] constitutes a difficulty for French students. As they generally produce it at a more frontal position while attributing more lip rounding to it, which matches the predictions established before.

6.1.1.4 The vowel sounds [ɑ:] and [æ]

The English sound system contains a back vowel [ɑ:] and a front vowel [æ]. This distinction does not exist in modern French, which creates a systematic gap for learners, and possibly interference. Since they are confronted to two distinct sounds that are both different from the French [a] sound.

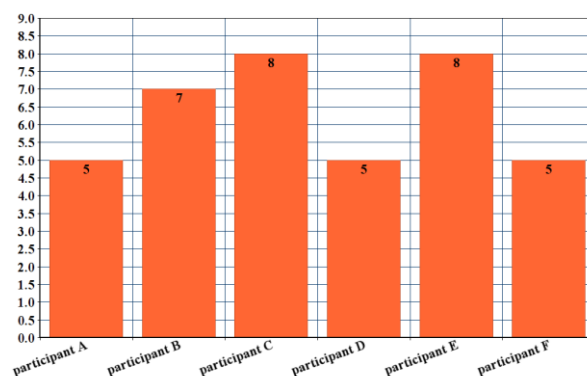
6.1.1.4.1 The sound [ɑ:] with the graphemes “a, -ea”

The sound [ɑ:] is different in its realisation between RP English and GA English. Wells (1982) explain that in the segment *are* /ɑ:r/ in RP omits the final [r] sound unless it is followed by a vowel, which results in the pronunciation [ɑ:]. GA English on the other hand, keeps the [r] at all times. The selected segments will therefore be more focused on the realisation of the vowel itself rather than the consonant sound [r].

The selected segments are as follows:

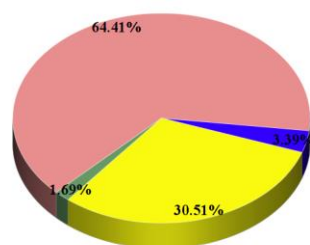
{ are /ɑ:r/, star ship /'stɑ:ʃɪp/x2, heart /hɑ:t/x2, bypass /'baɪpɑ:s/, last /lɑ:st/x2, task /tɑ:sk/. }

Diagram 31: Correct realisations of the vowel sound [ɑ:] with the grapheme “a, -ea”



The results show that half the participants can demonstrate average rates of accurate usage of the tense vowel [ɑ:]. Nevertheless, the overall pronunciations are characterised with a tense articulation that abridged the vowel to an [ɑ] sound. As for the cases of substitution, the French sound [a] and the English sound [æ] were used as replacement in 30% the cases of error. The reason being that, the two sounds share the same grapheme and are adjacent in the Jones diagram. Moreover, a case of parasitic [h] sound was registered in a segment with a stressed vowel at the beginning of the word “are”, and which will be explained in the section dedicated to the [h] sound.

Diagram 32: Pronunciation of the vowel sound [ɑ:] and alternative sounds with the graphemes “a, -ea”



All things considered, the lax vowel [ɑ:] continues to constitute a difficulty for advanced learners of English, mainly in the length attributed to it. This is due to the fact that such length is attributed to what is referred to as diphthongised vowels, thanks to the constant movement of the organs of speech a speaker must commit to. However, some parameters of the tense mode of French articulation may still be unconsciously employed by French students, which causes the reduction and stability of the timbre of lax vowels.

6.1.1.4.2 The sound [æ] with the grapheme *a*

The sound [æ] is mostly associated with the grapheme *a* in English. In French however, the same grapheme is associated with the similar yet not identical open front unrounded vowel sound [a], which could act as a substitute based its closeness to [æ] in the Jones diagram.

The selected segments are as follows:

{*sadly* /'sædli/, *angles* /'æŋɡlz/, *planet* /'plænɪt/, *attitudes* /'ætɪtjuːdɪz/, *detachment* /dɪ'tætʃmənt/, *personality* /pɜːsə'nælɪti/, *analysts* /'ænəlistɪz/, *natural* /'nætʃrəl/, *scanned* /skænd/, *exactly* /ɪɡ'zæktli/.}

The results suggest that the vowel sound [æ] constitutes a difficulty for advanced learners, considering that its location on the Jones diagram is not used in French. As a result, the two sounds that acted as substitutes, in almost 50% of the occurrences, are the front sounds [a] and [ɛ]. Expressly, the [æ] sound is situated in a frontal position between the open sound [a] and the mid open sound [ɛ], which makes them vulnerable for transfer. Furthermore, the production of the sound [æ] requires considerable spread (Ginésy, 2014, p. 21) compared to the two French substitutes, and such a feat was registered in half the correct instances only.

Being a language that rarely distinguishes between the [a] sounds, modern French imposes an additional restriction on EFL learners which consists of distinguishing [æ] from [ɑ:]. An error relating to this was recorded as in 5% of the instances participants substituted the vowel [æ] with [ɑ:]. As a result we recognise this case as an overgeneralisation of the rules of L2.

Diagram 33: Correct realisations of the vowel sound [æ] with the grapheme *a*

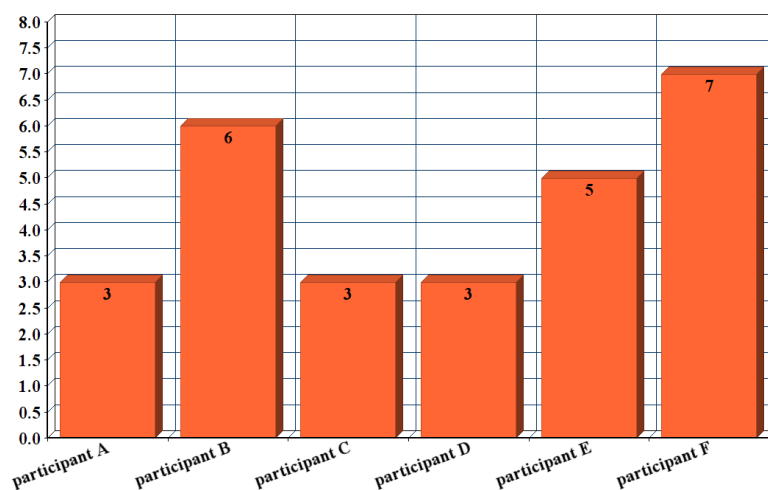
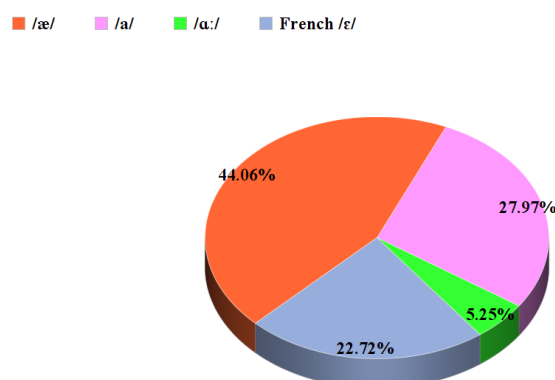


Diagram 34: Pronunciation of the vowel sound [æ] and alternative sounds with the graphemes *a*

All in all, the vowel sound [æ] has proven to generate excessive amounts of negative transfer for advanced learners. This is mainly due to language transfer, as it is a sound that constitutes a systematic gap for French learners and partly to the environment where it occurs. This error could safely be classified as a case of fossilisation as the realisation of a pure vowel is a skill that could have been acquired early on during the EFL learning process.

6.1.1.5 The issue with the vowel sound [ɒ]

The phoneme [ɒ] in RP English is a lax open back rounded vowel, as in the word *pot* /pɒt/. However, the sound underwent tremendous change in GA. Specifically, it would be pronounced as either a tense open back unrounded vowel [ɑ] as in *job*, or as a tense open-mid back rounded vowel [ɔ] as in *born* (Wells, 1982). Therefore, we can conclude that the RP sound [ɒ] does not exist in GA English, and it would be inaccurate to use it as a basis for the assessment of the pronunciation of participants who may adhere to GA variety. This is the main reason why the process of phoneme selection paid utmost attention to the criterion that every selected segment must be pronounced exactly the same way in both variations of the language. Consequently the sound [ɒ] shall be skipped in favour of the [ɔ:] which may vary in length in the two dialects, but is still fundamentally a common element between RP and GA.

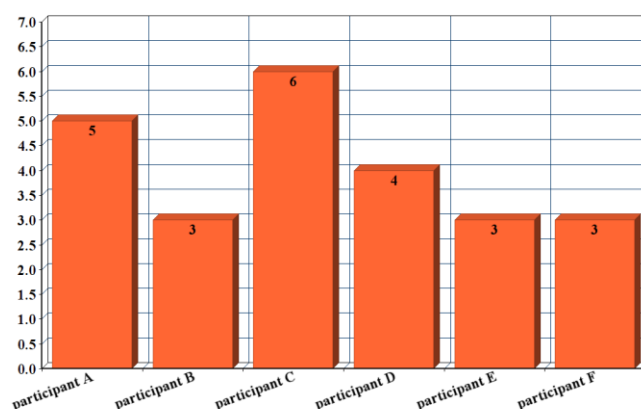
6.1.1.6 The vowel sound [ɔ:]

The open-mid back rounded vowel [ɔ:] is a long vowel in RP English¹⁸ and is therefore closer to the French sound [o] in *beau*, than is it to [ɔ] in *dogue*. Additionally, it is associated with the graphemes “-or, -oar, -ought, -au, -aw” (Ginésy, 2014, p. 26).

The selected segment are the following:

{ *before* /bɪ'fɔ:/:, *born* /bɔ:n/, *force* /fɔ:s/, *normal* /'nɔ:məl/, *deformed* /di'fɔ:md/, *stormed* /stɔ:md/, *aboard* /ə'bɔ:d/, *thought* /θɔ:t/, *paused* /pɔ:zd/, *awful* /'ɔ:fəl/. }

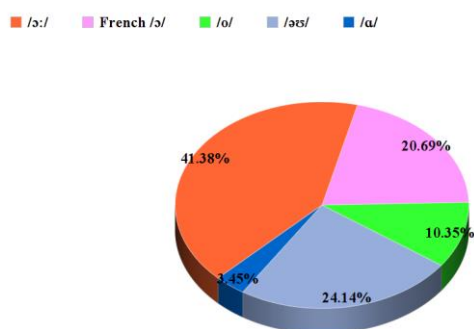
Diagram 35: Correct realisations of the vowel sound [ɔ:] with the graphemes “-or, -oar, -ought, -au, -aw”



The observations of this section offer results relative to each spelling. Particularly, the sequence *-or* generated either accurate [ɔ:] sounds or one of the French short back vowel [ɔ] and [o]. Which should be expected, considering the fact that the two are the closest French equivalents. Moreover, the graphemes “-oar, -ought, -au, -aw” contain two vowel letters which, in some cases, has created confusion that led a few participants to produce the diphthong [əʊ] especially in the segments *paused* and *awful*.

¹⁸ Fournier classifies it as a closing diphthong because of the movement it carries, Ginésy however considers it as a long vowel, and we will recognize it as such for the purposes of this dissertation.

Diagram 36: Pronunciation of the vowel sound [ɔ:] and alternative sounds with the graphemes “-or, -oar, -ought, -au, -aw”



All in all, the [ɔ:] sound being a long vowel that requires constant movement, is expected to be a challenge for speakers of a language that does not permit any movement between sounds. Thus, negative transfer for this vowel could be attributed to both the phonological background of the learners, as well as their generalisation of distributional rules of the vowel sound.

6.1.1.7 The vowel sounds [i:] and [ɪ]

The phonemes [i:] and [ɪ] form another pair of sounds that might constitute a difficulty for French speakers. Considering that their inventory of phonemes does not differentiate between the two, and simply contain but a singular front close unrounded vowel [i].

6.1.1.7.1 The vowel sound [i:]

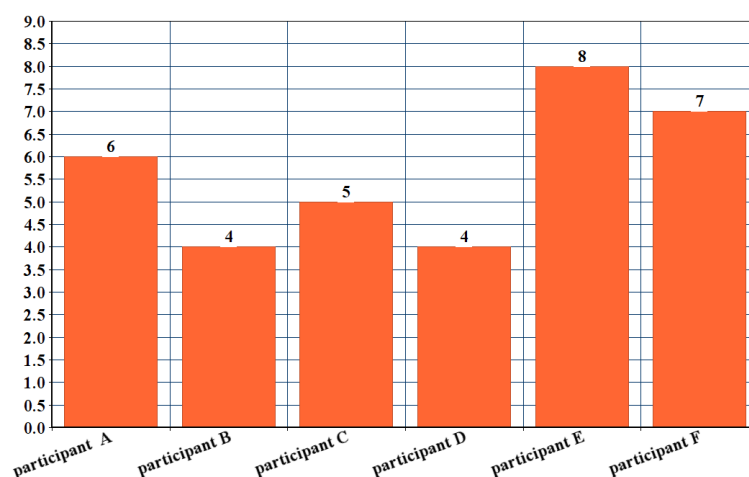
This vowel sound is classified as a diphthongised vowel by Ginésy (2014), based on the movement it requires throughout its realisation. Furthermore, its phonetic symbol contains the [:] which indicates that it is a long vowel.

The selected segments are the following:

{*even* /'i:vən/, *reveals* /rɪ'vi:lz/, *people* /'pi:pl/, *reasons* /'ri:znz/, *police* /pə'li:s/ *colleagues* /'kɒli:gz/, *beamed* /bi:md/, *dreams* /dri:mz/, *screen* /skri:n/, *female* /'fi:meɪl/.}

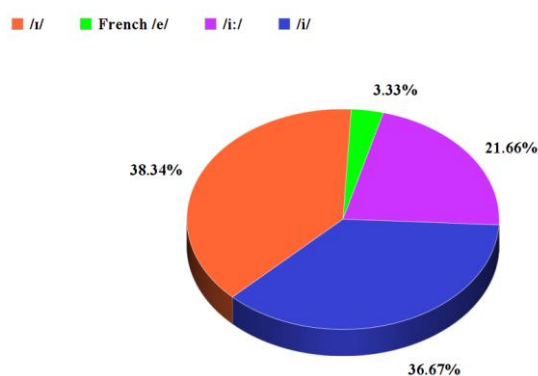
The results show average rates of correct usage of the sounds [i:] by the majority of the participants. The errors produced could be explained in terms of transfer as they fall into the predictions we established earlier. Notably, in almost 37% of the cases, the sound [i:] was

Diagram 37: Correct realisations of the vowel sound [i:] with the graphemes “-i, -e, -ea”



shortened to an [i] sound. That is due to the fact that the influence of the French tense mode of articulation is still in effect among the student, as well as the fact that the corresponding sound [i] in French is shorter in its realisation. Adding to that, more than 38% of the errors consisted of under-differentiation between the tense vowel [i:] and the lax vowel [ɪ]. In other words, the meawhich is a shortening of [i:] as well as the removal of its diphthongisation property. An expected outcome considering that modern French bans diphthongs. And finally, a small percentage of the errors is attributed to the substitution of the long sound [i:] with a frontal mid-open vowel sound [e] in the segment *people* and this was due to multiple factors. Firstly, the sound [i:] in this segment is followed by a voiceless consonant, which makes it considerably shorter compared to other segments. Secondly, considering the fact that graphemes in French do not have the same discrepancies of pronunciation compared to the English counterparts, the grapheme *e* in French invites the phoneme [e] and not [i:]. And

Diagram 38: Pronunciation of the vowel sound [i:] and alternative sounds with the graphemes “-i, -e, -ea”



thirdly, considering the fact that French is characterised by a more frontal pronunciation, it is usually by reflex that French natives produce their sounds in a more frontal position.

All in all, the sound [i:] generated negative transfer mainly because of its two properties that set it apart from its equivalent in the French sound system, in other words, the vowel's considerable length and the diphthongisation.

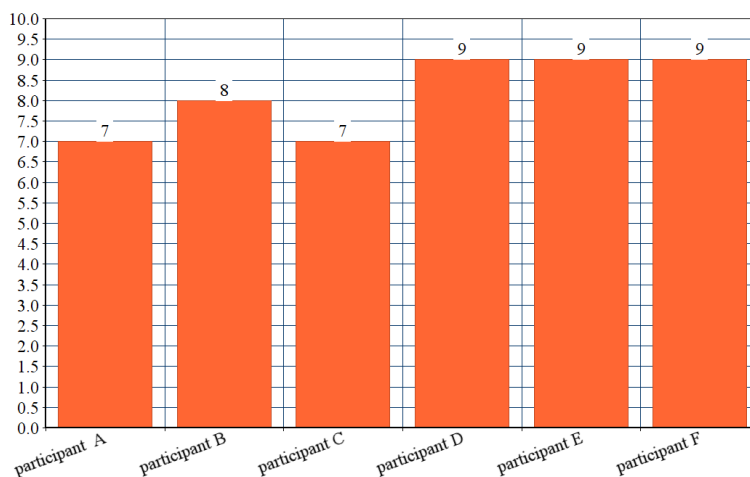
6.1.1.7.2 The vowel sound [ɪ] with the graphemes “-i, -e”

The most common spelling of the sound [ɪ], but not the only one, is the grapheme [i] (Ginésy, 2014, p. 18). However, as established before, the English [ɪ] sound is shorter than the French [i] sound.

The selected segments are as follows:

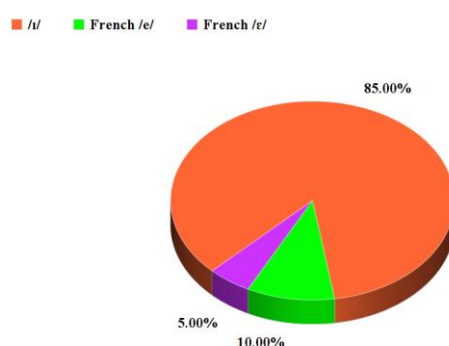
{ *ship* /ʃɪps/, *edifices* /'ɛdɪfəsɪz/, *president* /'prezɪdənt/, *instant* /'ɪnstənt/, *flickered* /'flɪkəd/,
detachment /dɪ'tætʃmənt/, *personality* /pɜːsə'nælɪti/, *vanish* /'væniʃt/, *systematically*
*/sɪstə'mætɪkli/, *looking* /'lʊkɪŋ/. }*

Diagram 39: Correct realisations of the vowel sound [ɪ] with the graphemes “-i, -e”



The results show that at least half of the participants boast a near perfect mastery over the sound [ɪ] in this environment. The similarity between the sound [ɪ] and the grapheme *i* does not seem to cause distributional errors, however we cannot claim that this is a case of positive transfer since the two sounds may have similar pronunciation parameters but remain unique sounds. Furthermore, the few cases of error occurred with the grapheme *e* in unstressed syllables in the segments *detachment*, *edifices*, which deluded some participants to employ more frontal sounds such as [e] or [ɛ].

Diagram 40: Pronunciation of the vowel sound [ɪ] and alternative sounds with the graphemes “-i, -e”



Being a pure vowel, the [ɪ] sound does not require any diphthongisation. In addition, it is shorter than the French unrounded sound [i]. Therefore, it could be speculated that the greater mastery over the sound [ɪ] is partly due to the fact that it does not require pronunciation parameters that are absent from the French articulation system, without forgetting the efforts from the parts of the learners.

6.1.1.8 The vowel sounds [ʊ] and [u:]

The lax vowel [ʊ] and the tense vowel [u:] are represented in the French inventory of phonemes by the same [u] sound. This makes the two English sounds into a minimal pair which could be the source of confusion.

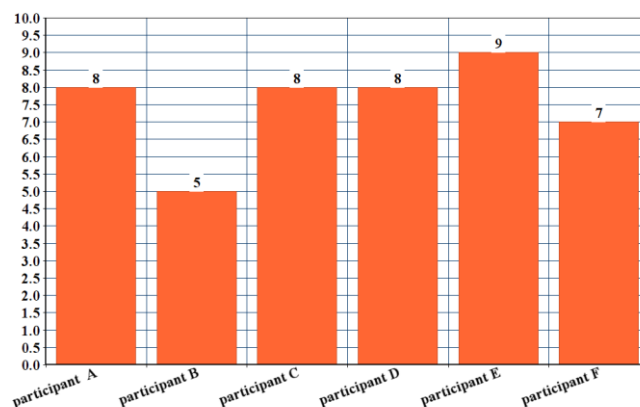
6.1.1.8.1 The vowel sound [ʊ] in the graphemes “-ou, -u, -oo”

The near-close back rounded vowel [ʊ] is closer to the centre than it is to the back on the Jones diagram. In addition, it shares the grapheme *u* with the central vowel [ʌ] (Ginésy 2014, p.27), which might engender distributional errors between the two sounds. Furthermore,

the vowel [ʊ] can be associated with the spellings: “-ook, -oo, -ou” (ibid) accordingly, the selected segments are the following:

{ would /wʊd/, looked /lʊkt/, book /bʊk/, awful /'ɜ:fʊl /, good /gʊd/, cheerfully /'tʃiəfʊli/
beautiful /'bjʊ:təfʊl/, couldn't /'kʊdnt/, wonderful /'wʌndəfʊl/, successful /sək'sesfʊl/. }

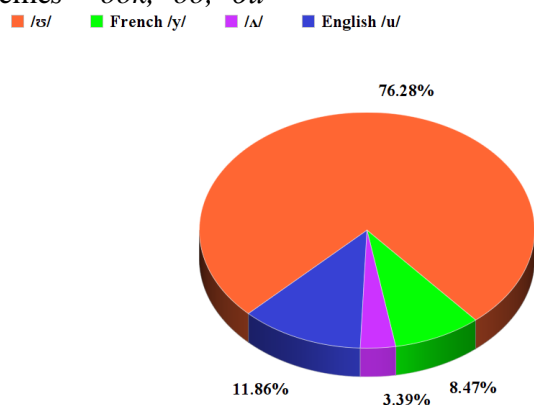
Diagram 41: Correct realisations of the vowel sound [ʊ] with the graphemes “-ook, -oo, -ou”



It was observed in this section that most of the participants are able to produce the sound [ʊ] with descent accuracy. Furthermore, the errors registered for this sound could be explained in terms of transfer and phoneme-grapheme correspondences. Firstly, the sounds [ʊ] was substituted with the closest French equivalent [u], in almost 12% of the cases of error. This could stem from the facts that [ʊ] occupies a rather central position on the diagram of Jones. Which in an area that is mostly empty in the French diagram of vowels. Additionally, for this case of substitution, the selected segments contained the graphemes *-oo* and *-ou* which invite the sound [u] in the French pronunciation system rather than the sound [ʊ]. Secondly, almost 9% of errors constituted of substitutions with the close front rounded French vowel [y] in the grapheme *-u*. This grapheme usually invites the sound [y] if not paired up with other vowels (Didier, 1927, p. 118).

Consequently, we can attribute these instances of error to an over-differentiation error from the part of the participants. However, this can hardly be considered an advanced level error, and will therefore be regarded as a fossilised pronunciation. And thirdly, a little more than 3% of the errors were substitutions with the English strut in the grapheme *u*, which could be an overgeneralisation of the L2 phoneme-grapheme correspondences, since both [ʊ] and [ʌ] occur in the same grapheme.

Diagram 42: Pronunciation of the vowel sound [ʊ] and alternative sounds with the graphemes “-ook, -oo, -ou”



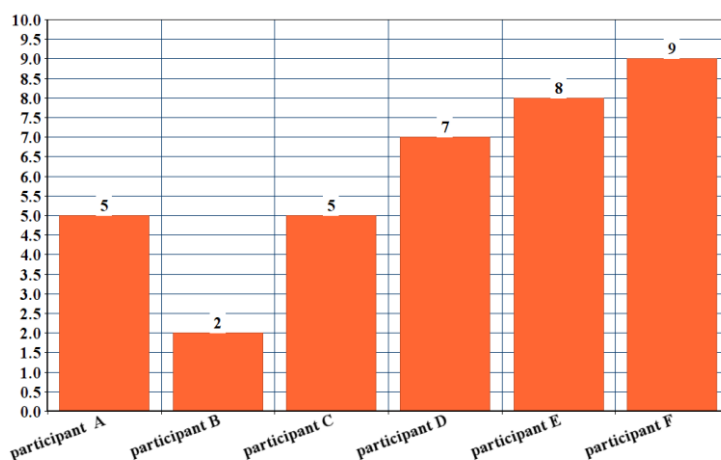
To conclude, the sound [ʊ] constitutes but a minor difficulty for advanced learners in terms of articulation. The relatively small amount of error it caused, could be traced back to either their phonological background, or to distribution errors considered the variety of graphemes it may correspond to.

6.1.1.8.2 The vowel sound [u:] with the graphemes “-ew, -o, -u, -eau”

The Close back rounded vowel [u:] is a diphthongised vowel that requires movement of the organs of speech throughout its realisation. Additionally, it is a tense vowel, which makes it longer than its French equivalent [u] (Ginésy, 2014, p. 29). The selected segments are as follows:

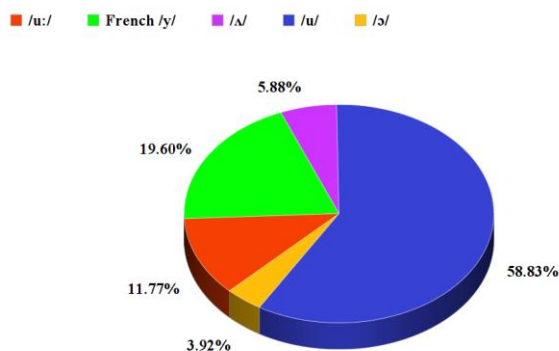
{*protruded* /prə'tru:did/, *who* /hu:/, *rule* /ru:l/, *into* /'ɪntu:/, *who* /hu:/, *rectitude* /'rɛktɪtu:d/,
crew /kru:/, *moving* /'mu:vɪŋ/, *you* /ju:/, *revolutionary* /,revə'lu:ʃnəri/, *beautiful*
 /'bjʊ:təfʊl/, *pursuing* /pə'sju:ɪŋ/, *threw* /θru:/, *duty* /'dju:ti/.}

Diagram 43: Correct realisations of the vowel sound [u:] with the graphemes “-ew, -o, -u, -eau”



The results show that the mastery of the sounds [u:] fluctuate greatly between the participants. Participants A, B, and C seem to struggle with its production. Whereas the rest appear to have no issues with its pronunciation. As a result, the errors observed form a variety of example. Notably, the most recurrent sound substitution is the production of the vowel sound [u:] as a pure vowel [u], which lacks diphthongisation and proper length. This could be due to the fact that the French pronunciation does not allow diphthongisation. A property which was transferred to the pronunciation of the [u:] sound. In addition, two particularities of the French sound [u] may also be partly transferred to the pronunciation of the [u:] sound, namely, the vowel length and the tense articulation, which might explain the tense and short realisation of the sound.

Diagram 43: Pronunciation of the vowel sound [u:] and alternative sounds with the graphemes “-ew, -o, -u, -eau”



The second error concerns the grapheme *u*, which if not paired up with another vowel, in French attracts the close rounded vowel [y]. This characteristic might have been the reason behind 20% of the errors, which constituted of substitutions with the sound [y] in segments such as *rule*, *rectitude*, and *protruded*. And lastly, the vowel sound [ʌ] was utilised as a replacement for the sound [u:] in the grapheme *u*, in almost 4% of the total of errors, which classifies this error as an overgeneralisation of the pronunciation rules of L2 sounds.

To conclude, the diphthongised vowel [u:] can be the cause for considerable amounts of errors, most of which are attributed to negative transfer, which is used by the participants in response to systematic gaps, or to the over-generalisation of French rules of pronunciation unto the pronunciation of English.

Pure vowels have proved to generate varying amounts of negative transfer, due to the different properties they have in English and French. Furthermore, diphthongised vowels such as [i:] and [u:] caused more errors than pure vowel, because they require parameters that do not exist in the French pronunciation system. Such as, constant movement during sound production, and diphthongisation. As a result it can be safely assumed that language transfer plays a mostly negative role on the production of pure vowels among advanced students of English.

6.1.2 Diphthongs

The elements examined in this section are the closing diphthongs [aʊ], [eɪ], and [aɪ] which are sounds that glide toward the closing vowels [ʊ] and [ɪ]. In addition, the comparative analysis carried out in the first chapter established diphthongs as systematic gaps, which should generate high levels of transfer, in the form of separation of the diphthong into pure two vowels, or the production of single long monophthong.

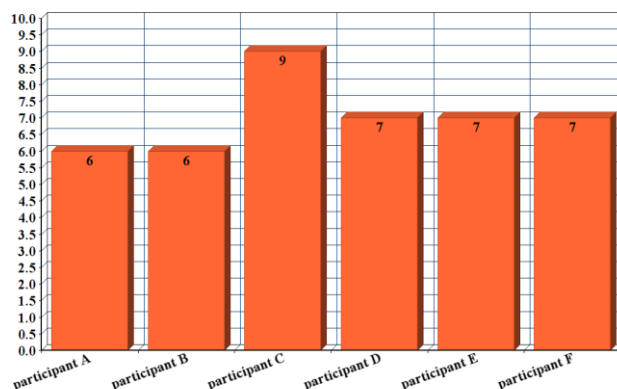
6.1.2.1 The diphthong [aʊ] with the graphemes “-ou, -ow”

The selected segments are as follows:

{*about* /ə'baʊt/, *council* /'kaʊnsəl/, *round* /raʊnd/, *clouds* /klaʊdz/, *doubt* /daʊt/ *mouth* /maʊθ/, *frowned* /fraʊnd/, *loudly* /'laʊdli/, *shouting* /'ʃaʊtɪŋ/, *powerful* /'paʊəfʊl/.}

The initial results show slightly above average rates of correct realisations of the diphthong [aʊ] by the participants. Additionally, the errors observed for this vowel section vary in terms their explanations, and will therefore be separately explained below:

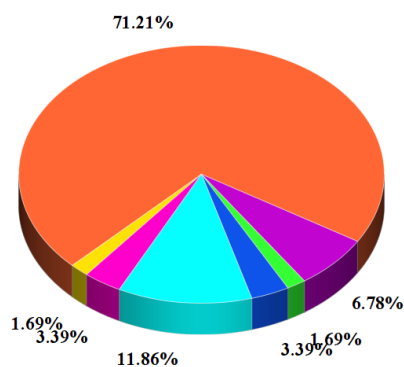
Diagram 44: Correct realisations of the diphthong [aʊ] with the graphemes “-ou, -ow”



- The tense vowel [ɑ:] was employed as a substitute for the diphthong [aʊ] in almost 12% of its occurrences. Such an error could be attributed to negative transfer and ultimately, the inability to achieve a gliding movement from the [a] towards the [ʊ] sound. This could be the direct effect of the rigidity of the French pronunciation system that does not allow for movement between sounds. Consequently, the participants resorted to the production of longer version of the first vowel of the diphthong, as it is more prominent than the second.
- In 9% of the cases, the French rounded back vowels [ɔ] and [o] replaced the diphthong [aʊ], in graphemes that contain *o*, as in the segments *council*, *frowned*, and *powerful*. This error might result from the failure to achieve the gliding movement, from the part of the students, who resorted to the closest French equivalent.

Diagram 45: Pronunciation of the diphthong [aʊ] and alternative sounds with the graphemes “-ou, -ow”

■ /aʊ/
 ■ French /ɔ/
 ■ /o/
 ■ /ae/
 ■ /ɑ:/
 ■ /a/ /ɜ:/
 ■ /ə/



- Sound substitution was also observed, among other participants, between the front sounds [æ] and [ø] and the diphthong [aʊ], in the segments *council, frowned, and powerful*. And similarly to the other substitutions, this error stems from the inability to achieve diphthongisation. Additionally, these sounds were employed because the French sound system favours a frontal pronunciation, and therefore it is by reflex that participants employ sounds from frontal positions.
- The last error this section will examine is the production of the diphthong [aʊ] as two separate vowels [a], [ʊ] without the required glide from the first sound to the second, this was observed in the segments *doubt and cloud*. Fournier considered this error to be a beginner level error, thus it can be concluded that it constitutes a case of fossilisation.

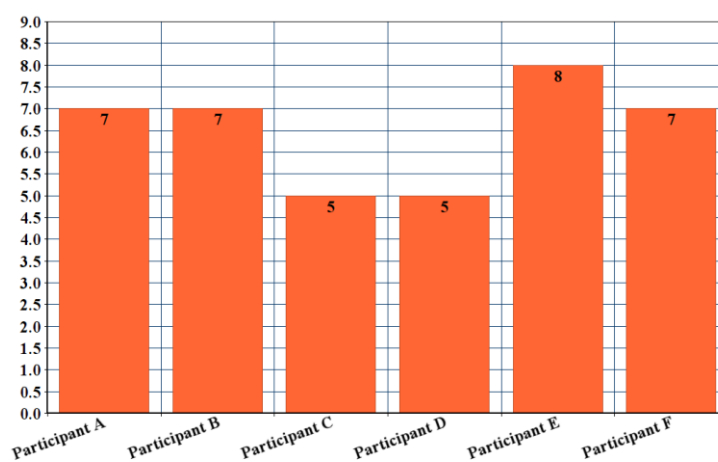
All in all, despite being a complex sound and a systematic gap the diphthong [aʊ] did not generate as many errors as other pure vowels such as [ə] and [ʌ]. This might hint to the conclusion that the gliding it requires is a skill that was fossilised at a developmental state among the participants. In other words, their accuracy of diphthong production depends on the environment in which it occurs, more than the diphthong itself. However additional data is required to confirm such a claim.

6.1.2.2 The diphthong [eɪ]

The closing diphthong [eɪ] corresponds to the graphemes “-a, -ay, -ai, -ei, -ey” (Ginésy, 2014, p. 35) the text used in this experiment however, contained the graphemes -a, and -ay only. Accordingly, the selected segments are as follows:

{*case* /keɪs/ *slug-brained* /slʌg-breɪnd/ *misplaced* /mɪs'pleɪst/ *face* /feɪs/ *away* /'weɪ/ *take* /teɪk/ *behaviour* /bɪ'heɪvjə/ *always* /'ɔ:lweɪz/ *located* /ləʊ'keɪtɪd/ *female* /'fi:meɪl/ }

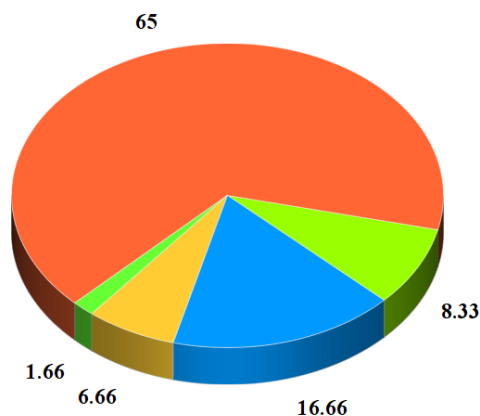
Diagram 46: Correct realisations of the diphthong [eɪ] with the graphemes “-a, -ay”



Initial diagnosis reveals slightly above average scores of accurate realisations of the diphthong [eɪ] for most of the participants. Furthermore the mispronunciations incurred could be explained in terms of phonological transfer. Firstly, the French front vowel sound [e] was the most common sound substitute for the diphthong [eɪ]. This instance of transfer matches the predictions established before, for the participants produced an abnormally long vowel sound that is devoid of movement, instead of the diphthong [eɪ], in segments such as *make*, *located*, and *behaviour*. The reason being that, in any diphthong, the first vowel is more prominent than the second. And thus, it is to be expected of EFL learners to focus on articulating it clearly and loudly, which could result in the omission of the second sound entirely. Likewise, the English vowel sound [ɪ] was employed as a sound replacement for the diphthong [eɪ] in the segment *brain* by four participants. This could be the result of the over-generalisation of the rules of pronunciation of the grapheme *ai* in French to the English equivalent. Such a grapheme attracts the French front vowel [e] (Didier, 1927, p. 83), additionally, it is a sound that is situated at proximity from the sound [ɪ] in the Jones diagram, which makes it a possible substitute.

Diagram 47: Pronunciation of the diphthong [eɪ] and alternative sounds with the graphemes “-a, -ay”

■ /eɪ/ ■ /ɪ/ ■ french /e/ ■ /ə/ ■ /aɪ/



The SCHWA is an English vowel sound that can replace any of the pure vowels [a, e, i, u, o] if found in unstressed syllables (Ganske, 2008, p. 62). Consequently, it was employed as a sound substitute for the diphthong [eɪ] when it occurred in unstressed syllables, in the segments *always* /'ɔ:lweɪz/ *female* /'fi:meɪl/. Expressly, the participants overgeneralised the rules of pronunciation of the SCHWA to the diphthong [eɪ], while treating it as a pure vowel.

Moreover, the grapheme *a* in the segment *located* confused some participants into producing the diphthong *ai*. However, this cannot be classified as a distributional error considering that the latter diphthong does not occur in the grapheme *a* (Ginésy 2014, p.36). It could be due to an over-generalisation of the rules of pronunciation of the grapheme *a* in French into English while trying to produce the diphthong [eɪ], yet the data collected is insufficient to support this claim.

To sum up, CAH suggests that the farther a sound is from the L1 the more transfer it generates. However, in the case of the diphthong [eɪ], a look at the Jones diagram reveals that it requires relatively less movement when compared to the other diphthongs selected for this study. Additionally, it is composed of the sounds [e] and [ɪ] which should be considered as ‘similar’ sounds according to Flege’s similarity hypothesis. Nevertheless, this diphthong proved to generate more transfer, as well as distributional related errors, than other diphthongs with greater movement and less similar component sounds, which hints to the possibility that similarity is a source of error as well.

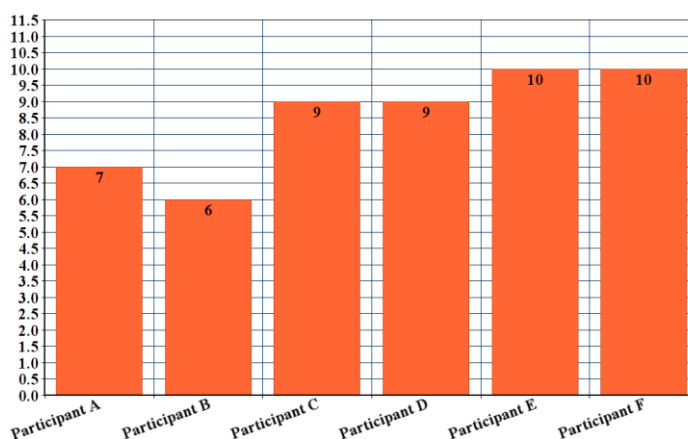
6.1.2.3 The diphthong [aɪ]

The closing diphthong [aɪ] is associated mainly in the graphemes “-i,-igh” (Ginésy, 2014, p. 36). Accordingly, the selected segments are the following:

{*designed* /dɪ'zaind/, *slimy* /'slaimi/, *vile* /vaɪl/, *bribery* /'brɪbəri/, *wiped* /waɪpt/, *decided* /dɪ'saɪdɪd/, *brightly*/'braɪtli/, *bite* /baɪt/, *smile* /smaɪl/, *provided* /prə'vaɪdɪd/.}

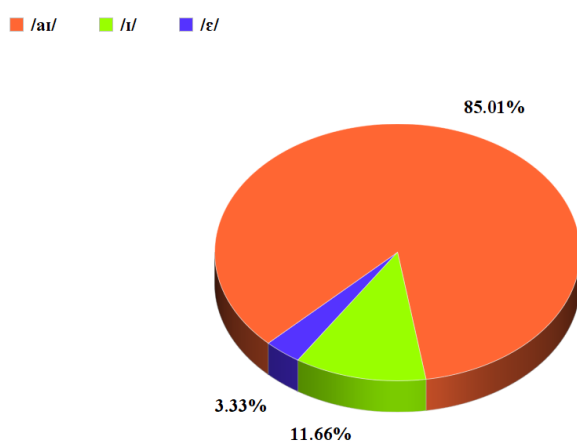
The initial observations show that the majority of the participants can boast near perfect mastery of the diphthong [aɪ] in this environment. The errors registered mounted to 15% of the sum of the selected occurrences, and they can be explained as follows:

Diagram 48: Correct realisations of the diphthong [aɪ] with the graphemes -i



- A sound close to the English vowel [ɪ] was employed, by 3 participants, as a sound substitute for the diphthong [aɪ] in segments containing the grapheme *i* such as *vile*, *bribery*, and *slimy*. This could be attributed to more than one factor. Firstly, the grapheme *i* in French is associated with the sound [i] (Didier, 1927, p. 88). Thus, this rule of pronunciation seems to have been transferred to the same grapheme in English. Secondly, the sound [ɪ] is a neighbouring sound to the French front vowel [i] which makes it a suitable substitute. And thirdly, one of the most common errors for a French native is the reduction of diphthongs into pure vowels. And thus we can safely assume that this error is a case of negative transfer.

Diagram 50: Pronunciation of the diphthong [aɪ] and alternative sounds with the graphemes *-i*



- The segment *brightly* incurred a mispronunciation that consisted of a sound substitution of the diphthong [aɪ] with the French front vowel sound [ɛ], which is situated in the middle of the trajectory of the diphthong [aɪ] on the Jones diagram. However, being a unique sample we cannot rule out the possibility that it may have been nothing more than a reading mistake. Additional data is required to confirm this as a pattern of error.

The diphthong [aɪ] generated the lowest amount of errors among the participants despite requiring considerable glide from a central mid close position to a central mid open position. Which could lead to the conclusion that sound difficulty cannot be boiled down to ‘similar’ and ‘new’, rather to multiple factors including both the differences and the similarities of the L2 sound with the L1 equivalents.

To conclude on the section of vowels, advanced learners demonstrated an above average mastery of the selected vowels. With better results in realisation than in distribution. The pure diphthongised vowel [u:] generated the lowest accuracy rating with 11.7%. By contrast the pure vowel [ɪ] and the diphthong [ai] were produced with 85% accuracy by the students. However, the acquisition of vowels begins at an early stage of the learning process. Thus, the persistence of influenced pronunciation among advanced learners proves that phonological transfer can have an everlasting effect, in other words, fossilisation.

6.2 Consonants

The analysis of consonants was performed differently because consonants are fundamentally different from vowels. Firstly, they do not constitute the nucleus of the syllable. This means that their rate of occurrence is higher than that of vowels, and should therefore provide a more abundant source of segment to analyse. And similarly to vowels, consonant sounds will be examined in terms of their accurate realisation, while focusing on out errors that could be related to transfer such as: “sound substitution, over/under differentiation, or distribution errors”. The consonants examined in this section are the plosives: [p], [t], [k], [b], [d], [g], and the fricatives: [f], [v], [s], [z], [ʃ], [ð], [h], and [θ].

6.2.1 Plosives sounds

Plosives are almost identical in terms of pronunciation parameters in English and French, except for [t] and [d] which are more frontal in French. Accordingly, they are expected to generate positive transfer, conforming to the ideas proposed by Corder: “in the case of facilitation, one may expect that the quantity of developmental error will be less since passage through the syllabus will be accelerated” (1981, p. 99).

6.2.1.1 The voiceless plosives [p], [t], [k]

The table 3 below shows the total number of occurrences of each sound, as well as the instances of error for each of the voiceless plosive sound, as produced by the participants.

The text used in this experiment contained 9 instances of the aspirated voiceless consonant [p], which are the following:

{*pointlessly* [ˈpʰɔntlɪsli], *people* [ˈpʰi:pl], *possible* [ˈpʰɔsəbl], *paying* [ˈpʰeɪŋ], particularly [ˈpʰɜ:fɪktli], *personal* [ˈpʰɜ:snl], *pencil* [ˈpʰɛnsl], *powerful* [ˈpʰaʊəfʊl]}.

Consonant aspiration is a feature that is absent from the French pronunciation system. As a result, French students under-differentiate between the unaspirated and aspirated [p] sound in onset position of stressed syllables. The magnitude of this error is not trivial, as the

correct production of this aspiration by the participants, amounts to 30% of the occurrences of the aspirated [p] in the text. Furthermore, the students' production of the consonant sound [p] is characterised with a stronger implosion. This is most likely due to the tense mode of articulation in French, and the muscle tension it imposes on the production of sounds.

Table 3: Pronunciation of the voiceless plosives [p], [t], [k]

	[p] 93 occurrences	[t] 291 occurrences	[k] 124 occurrences
participant A	3 under-differentiations	correct realisations ¹⁹	3 under-differentiations
participant B	5 under-differentiations	3 elisions	1 elision & 7 under-differentiations
participant C	4 under-differentiations	2 substitutions for /tʃ/	6 under-differentiations
participant D	8 under-differentiations	correct realisations	1 phonological process & 7 under-differentiations
participant E	9 under-differentiations	correct realisations	9 under-differentiations
participant F	9 under-differentiations	substitution for [ʃ]	1 elision & 9 under-differentiations

The consonant sound [t] is more frontal in French than it is in English. Consequently, the production of this voiceless sound by the participants was characterised with a slightly dental pronunciation that is typical for the French equivalent sound. In terms of errors, participant C produced the segments *particularly*, *continued*, and *consortium*, with a sound substitution of the [t] with an L1 allophone. Specifically, the French [t] sound may be realised as an [s] sound, that is closer to the English [tʃ] in some cases, with the graphemes “-*tie*, *tiè*, *-tion*” (Didier, 1927, p. 186). Hence, the transfer of the parameters of the French sound [t] onto the pronunciation of English [t] sound in similar environments. In addition, the French grapheme *t* is almost always silent in a final position, except in some rare cases (Didier, 1927, p. 187). Which could explain the elisions of the English [t] sound in the

¹⁹ The word ‘correct’ here does not imply a native like realisation, but the approximate pronunciation of the sound that does not classify it as one of the phonological processes proposed by Weireich (1953).

segments *burnt*, *instincts*, and *wouldn't*. The text did not contain any instance of the aspirated [t] sound, and will therefore not be discussed in this section.

The consonant sound [k] occurred aspirated in the following segments:

{ *captain* ['kʰæptɪn]x3, *council* ['kʰaʊnsəl], *currently* ['kʰʌrəntli], *cabin* ['kʰæbɪn] x2 *couldn't* ['kʰʊdnt], *colleagues* ['kʰɒli:gz] }.

Similarly to the aspirated [p], an overwhelming 75% of cases of under-differentiations was registered, between the aspirated and unaspirated [k] sounds. This can be attributed to the lack of the aspirated feature in the French pronunciation system. Furthermore, the consonant sound [k] was replaced with the French allophone [s] when pronouncing the grapheme *c* in the segment *rectitude*. This is an example of the transfer Weinreich referred to phonological processes.

All in all, the aspirated voiceless plosives [p, t, k] proved to be challenging for advanced EFL learners. Additionally, the excessively plosive quality of a French plosive sound was retained in most of the pronunciations of the participants. Which might indicate that when two sounds are 'similar'. And according to Flege's classification, learners would rely on their L1 knowledge even at advanced levels, which could be the cause of fossilised pronunciation.

6.2.1.2 The voiced plosives [b], [d], [g]

Similarly to the voiceless plosives, the English voiced plosives [b, d, g] resemble the French correspondent sounds. And bear only slight differences in terms of their exact places of articulation, as well as the intensity of their plosive quality.

The table 4 below reveals that the sound [b] incurred a minute amount of errors. Merely two cases of elision in the segment *improbability* by the same participant. However, since the consonant sound [b] in French does not have a silent realisation in the same circumstances. It is safe to eliminate transfer as a possible cause for error, and consider this case as a reading mistake instead. Nevertheless, the consonant sound [b] was generally the cause of positive transfer, as it was produced accurately by all of the participants, and the degree the plosive quality of French occlusive, was not as important as in other sounds.

Table 4: Pronunciation of the voiced plosives [b], [d], [g].

	[b] 98 occurrences	[d] 190 occurrences	[g] 62 occurrences
participant A	correct realisations	2 substitutions for /dʒ/	correct realisations
participant B	correct realisations	1 elision & 1 substitution for /dʒ/	correct realisations
participant C	correct realisations	1 substitution for /dʒ/	correct realisations
participant D	correct realisations	1 elision & 1 substitution for /dʒ/	correct realisations
participant E	2 elisions	correct realisations	correct realisations
participant F	correct realisations	correct realisations	1 substitution for [k]

The sound [d] was produced by half of the participants at a slightly more anterior point of articulation, which creates a sound that is sharper than the English [d] sound. Additionally, half the errors in the pronunciation of this sound, include the elision of the [d] in final position, conforming to the French rule of pronunciation of the grapheme [d], which states that it is generally silent in final positions (Didier 1927, p 185). The other half of the errors, however, proved to be challenging to explain in terms of transfer. Four participants substituted the sound [d] for a [dʒ] sound in the graphemes “-di” in the segments *immediately*, *demolishing*, and *hideous*. Incidentally, the French grapheme *d* does not seem to have a [dʒ] realisation, mainly because French is a language that does not allow for affricate sounds. English however, sometimes attributes Yod coalescence²⁰ to the grapheme *d* in words such as *soldier* /'səʊldʒə/, Therefore the explanation that could be provided here is merely a speculation, as the participants may have attempted to apply the English coalescence in graphemes that could potentially contain a [d] and [j] sound and would produce a [dʒ]. As a result, this error as an overgeneralisation of the rules of pronunciation of L2 into similar L2 environments.

²⁰ Coalescent is a term used in phonetics and phonology as part of the classification of types of assimilation. In coalescent (or ‘reciprocal’) assimilation, each of two adjacent articulations influences the other. An example is the fusion of [d] and [j] to produce [dʒ] in such phrases as *could you*. (crystal 2003 p.82)

The last plosive sound in this section is the consonant sound [g], which has generated overwhelming amounts of correct realisations. Additionally, the pronunciation of the [g] sound by five of the participants is very similar to the production of the same sound by the native speaker. Therefore, the [g] sounds remains almost error free, with merely one case of substitution with [k] in the segment “things” which is most likely nothing but a slip of the tongue.

To conclude, plosive consonant sounds have proven to be facilitating elements thanks to their acoustic resemblance to their French counterparts. The percentage of errors they incurred is minimal compared to the vowels. However, this similarity may have halted the L2 learning process of some students, to the extent that it prevents them from attaining native like pronunciation.

6.2.2 Fricative consonants

The category of fricative consonants contains the highest number of phonemes in English as well as French. However, unlike plosives this category contains consonant sounds that are language exclusive, along with the shared phonemes.

6.2.2.1 The fricatives [f], [v], [ʃ]

According to Didier (1927, p.213 & p.221), the English realisation of these fricative sounds is almost indistinguishable from that of French, if not for the fact that the lips play a more important role in the French articulation. Nevertheless, this did not affect the pronunciation produced by the participants, as no errors were registered among the pronunciations of the 74 cases of [f], 98 cases of [v] and 28 cases of [ʃ], which makes these fricatives the sounds that generated the highest amount of positive transfer in this study.

6.2.2.2 The fricatives [s], [z]

Chabert (2018, p. 67) states that “the issue with the sounds [s] and [z] is not concerned with their articulation as much as it is with their distribution”. The results in the table 5 below still show that a substantial amount of positive transfer was generated from the fricatives [s] and [z], compared to a trivial degree of interference. To illustrate, the sound [s] was completely unpronounced by 4 of the participants, at least once in final position in segments such as *psychiatrists*, *various*, *grunts*, and *aesthetics* which could be explained by the fact that the French [s] sound is seldom pronounced in final position (Didier, 1927, p.219-220). Thus, this case of transfer is as one of the phonological processes. Similarly, the substitution of the sound [s] for [z] is another case of over generalisation of the L1 allophone onto the correspondent L2 environment in the segments *case*, *precise*, *exercise*, and *analysis*.

Expressly, the rule states that the intervocalic [s] becomes voiced, in other words [z] (Didier 1927, p218), which is often the case in English as well (Chabert 2018, p 67). However, it is not an absolute rule that includes every intervocalic *s* as is the case for French.

The realisation of the sound [z] was mostly accurate among most student, the exception being participant E who demonstrated 5 instances of elision of the final [z] sound in segments such as *things*, *seconds*, *reveals*, and *dreams* as it is silent in final position in French in most cases (Didier 1927, p.219). This rule of pronunciation was therefore over generalised to English which explains the errors at hand.

Table 5: Pronunciation of fricatives [s], [z].

	[s] 203 occurrences	[z] 100 occurrences
participant A	1 elision & 2 substitutions for [z]	correct realisations
participant B	1 elision & 2 substitutions for [z]	1 elision
participant C	2 elisions & 2 substitutions for [z]	Correct realisations
participant D	1 substitution for [z]	2 elisions
participant E	5 substitutions for [z]	5 elisions
participant F	2 elisions & 5 substitutions for [z]	correct realisations

On the whole, the fricatives [s] and [z] do not pose any great difficulty in their realisation but they can prove to generate some confusion as to their interchangeability and distribution.

6.2.2.3 The fricatives [θ], [ð]

The English fricatives [ð] and [θ] constitute a systematic gap for French natives as their interdental place of articulation remains unused in the French articulation system. As a result, they are expected to cause a great deal of negative transfer in the form of substitution of [θ] or [ð] by the French [s] or [z] or by French [s] or [f] (Heim, 2006, p. 77-94, p. 105-107).

The table 6 below displays results that match the predictions proposed by Ginésy. As the instances of negative transfer, surrounding the fricative sound [θ], took the form of sound substitutions for the labiodental sound [f]. This could be explained by examining the figures

Table 6 students' pronunciation of the fricatives [θ], [ð].

	[θ] 24 occurrences	[ð] 124 occurrences
participant A	accurate realisations	1 substitution for [d]
participant B	3 substitutions for [f]	5 substitutions for [d]
participant C	accurate realisations	5 substitutions for [d]
participant D	20 substitutions for [f]	18 substitutions for [d]
participant E	5 substitutions for [f]	4 substitutions for [d]
participant F	2 substitutions for [f]	5 substitutions for [d]

below, which exhibit the places of articulation of the sounds [θ] and [f]. Expressly, the sound [f] shares its place of articulation with the sound [θ] which is the upper incisors. However the consonant sound [f] uses the bottom lip for its realisation whereas [θ] uses the tip of the tongue. It is therefore the result of these seemingly similar properties that most of the participants were compelled to employ the sound [f] in segments such as *anything*, *think*,



Figure 20 place of articulation of the sound [f]



Figure 21 place of articulation of the sound [θ]

nothing, and *something*. Arguably, an error of this magnitude among advanced level learners could easily be considered a fossilisation especially in the case of participant D, where substitution took place in 20/24 cases.

The voiced fricative consonant sound [ð] was substituted with the alveolar voiced sound [d], which is slightly less forward, making it one of the closest equivalents in the French inventory. This impact was most noticeable in grammatical words such as *then*, *though*, *they*, *the*, *this*, and *that*. Moreover this substitution matches the predictions established in the first chapter, and could be said to a fossilisation at this stage of learning based on its frequency among the participants, and their advanced level of English learning.

Overall, being systematic gaps, the fricatives [θ] and [ð] generated high amounts of negative transfer among advanced learners of EFL. This could indicate that, the use of an

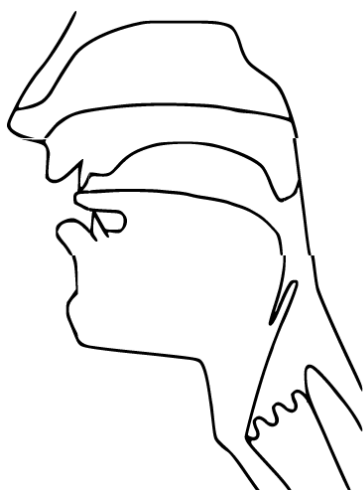


Figure 22: Place of articulation of the sound [ð]



Figure 23: Place of articulation of the sound [d]

unfamiliar place of articulation remains a challenging task for EFL learners, even at advanced stages of language acquisition. Additionally, the effects of the French phonological background, in this case are mostly negative and long lasting.

6.2.2.4 The consonant sound [h]

The consonant [h] is a fricative sound that utilises a minimal friction at the level of the glottis. A place of articulation rarely put to use in the French pronunciation system. Consequently, it should constitute a systematic gap that could affect L2 production. Heim (2006) predicted that the English [h] sound would be omitted by French speakers, while Ginésy (2014, p. 51) added that they would also insert a parasitic [h] sound at the beginning

Table 7 students' pronunciation of the fricative [h]

	[h] 97 occurrences	
participant A	correct realisations	1 parasitic [h]
participant B	8 elisions	11 parasitic [h] sounds
participant C	correct realisations	correct realisations
participant D	6 elisions	3 parasitic [h] sounds
participant E	5 elisions	6 parasitic [h] sounds
participant F	9 elisions	1 parasitic [h] sound

of stressed syllables that start with a vowel sound, considering that most stressed syllables in French begin with a consonant.

The results in the table 7 above show that the sound [h] remains the cause of negative transfer even among advanced learners. Furthermore, the predictions for error were accurate even if the percentage of error is still below 10% for the lowest scoring participant. To explain, the consonant sound [h] was silenced in segments such as *he, his, have, has* etc... which is due to the over generalisation of the rules of pronunciation of the [h] sound in French. Furthermore, the same phone was added to the beginning of segments such as *earth, angry, eyes, other, etc...* On this matter Jones goes as far as to say that: "This fault must be avoided at all costs. It is a mistake which will effectually spoil what is otherwise a good pronunciation, and it is one which often necessitates a great deal of practice to correct. It must be remembered that there is no break whatever in English between consecutive words which are closely connected by the sense "(1922, p. 33). In this respect, it is safe to assume that this is a case of fossilised pronunciation, considering the gravity of the error and the level of the learners.

All things considered, most of consonant sounds which regarded as 'similar' such as [p, t, k, d] , may in fact be have subtle differences, due to the language specific 'modes of articulation'. These distinctions are generally unperceived by the learners. As a result, they

would unconsciously produce English consonants the same way they would pronounce them in French, thinking they are identical. This leads to fossilisation and the inability to attain native like pronunciation. On the other hand, the consonant sounds [b, g, ʃ, f, v] proved to generate massive amounts of positive transfer that tower the rates of negative transfer of the most challenging vowels described in this section. And lastly, the consonants [θ, ð, h] which constitute systematic gaps, have confirmed that performing unpractised articulatory tasks can cause pronunciation errors even among advanced EFL learners. In this respect, the pronunciation of consonants is crucial for the development of an authentic pronunciation. Thus, a great deal of attention must be paid to the articulatory differences between the consonants of French and English starting from early stages of acquisition.

Conclusion

“It seems to be established beyond doubt: that transfer does occur in learner language, that transfer is developmental, i.e., that it is an integral part of how people learn language, that occurrence of transfer is systematic and not random, that transfer is constrained by the formal properties of the linguistic devices of the language involved, that there is variation in the use of transfer along several dimensions: individual variation among transfer-based learner utterances; situational or task specific variation in the sense that certain situations are more prone to trigger transfer based utterances than others; developmental variations as a function of the state of development of the learner’s L1 and L2.” Wode (1986, p. 174).

This experiment arrived to the conclusion that phonological transfer does indeed occur among advanced learners of English, as a strategy from their part to cope with English sounds they are yet to master. It was also established that error prediction based on the systematic comparison of the sound systems of the L1 and the L2, is a reliable tool for empirical studies of pronunciation. Additionally, considering that most of the predictions established in the first chapter matched the pronunciation of the participants, we can safely concur that that transfer is indeed “constrained by the formal properties of the linguistic devices of the language involved”(ibid) Furthermore, the effects and magnitudes of transfer vary depending on multiple factors: Firstly, the result displayed different levels of mastery of a sound, from one participant to another, in terms of production and phoneme-grapheme distribution. Secondly, the pronunciation assessment exercise plays a role in determining the type of transfer to be studied. The reading drill, for example, allowed us to examine transfer relating to phonological articulation, as well as phoneme-grapheme correspondences. Koda (1988) states

that: “phonological coding strategies used in L1 processing are transferred to L2 processing”. This leads to the conclusion that the graphical resemblance between the sounds of French and English is a possible cause for distributional errors in pronunciation exercises that rely on reading skills. Similarly, the deluge of such errors among advanced learners may confirm what Peereboom & Content (1998, p. 47) suggested: “compared to Spanish, German, and French, in English, grapheme-phoneme as well as phoneme-grapheme correspondences for vowels are thus clearly more difficult to master”. Thirdly, the effects of transfer were largely dependent on the sounds selected for study. The general idea proposed by CAH points towards the fact that similar sounds generally generate positive transfer, whereas new sounds inflict negative transfer. In this respect, English monophthongs are new sounds to the French inventory of phonemes, and have therefore generated heavy amounts of negative transfer, that were more in the scope of the predictions we have established. However, diphthongised vowels such as [i:] and [u:] caused more errors than simple vowels such as [ɪ], which reinforce the idea that negative transfer is more prevalent when the L2 employs articulation parameters that the L1 lacks. Conversely, The English closing diphthongs [aʊ], [eɪ], and [aɪ] engendered less negative transfer than pure vowels as opposed to the prediction established by CAH, which hints to the possibility that the gliding movement required for their realisation, is a pronunciation parameter that has already been assimilated by learners of an advanced level of English. Whereas the accurate realisation of pure vowels is dependent on more subtle differences and would demand additional attention. Furthermore, the phonological transfer observed in vowel sounds is more noticeable in terms of phoneme-grapheme associations, since from the perspective of the French native, the spelling of English is irregular. And lastly, Studying sound transfer in the production of consonant sounds has shown that similarity between phonemes promotes positive transfer with overwhelming amounts, only when the two consonants are virtually identical, as is the case for [f] and [v] for example. However, fossilised pronunciation may persevere with a learner, when the two consonant sounds are only deceptively similar; such is the case for the voiceless plosive sounds in French and English.

The phenomenon of fossilisation was relevant to this study as the students’ L2 production studied in this experiment, is likely the final product of their SLA process. Consequently, we can safely assume that their L2 acquisition has ceased to develop, as the errors observed as systematic and potentially chronic. In other words, learners would commit these errors indefinitely until specifically studied. Thus, this dissertation aimed at clarifying

the cases of fossilisation for this purpose. Fledge (1987) writes: “Adults might also be less able than children to modify previously established articulatory patterns (Kalikow & Swets, 1972). For example, native speakers of French might realize the [s] in English words with a dental rather than alveolar place of articulation (Valdman. 1976) because they are unable to modify articulatory patterns. Not because they fail to detect the acoustic differences between English and French [s] that might arise from small differences in phonetic realization.”

This dissertation has reached the conclusion that phonological transfer between French and English is more convoluted than previously thought, and that the simplistic predictive methodology of CAH is far from perfect. As a result, more comprehensive studies on the effects of the French phonological background on EFL production must be conducted in order to reach a more definitive conclusion. The relationship between French and English is indeed an interesting case for the study of sound transfer, as the French phonological background remains a double edged sword, which at times helps French natives skip through the learning of most of the consonants that are shared by the two languages, while at other times, prevent them from unconsciously producing the central vowels accurately, or pronounce back vowels without instinctively rounding them. However, this dissertation did no more than scratch the surface the phenomenon of sound transfer by demonstrating the effect it has of a small group of advanced learners, who believe that their L2 production is still lacking, and which could influence their will of voluntarily using it. Hopefully, this dissertation has elucidated to them and to learners like them, some of the factors behind a portion of their influenced pronunciation.

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Abstract

The pronunciation of the second language has been under the scope of scholars ever since the 1950s. It was studied in terms of the implication of the native language on it as well as the intermingling relationship between the two languages. When it comes to the effects of the phenomenon of transfer in an environment where French is an L1 and English is an L2, we have compared the phonological production of 6 LLCER M2 students and arrived at the conclusion that transfer has a majorly negative impact on the pronunciation of English vowels. On the other hand, consonants that are similar in both languages were responsible for high amounts of positive transfer, but consonants that do not exist in the French phonological background caused medium levels of negative transfer. Moreover, some of the errors registered could be recognised as fossilised pronunciation due the fact that they are produced by advanced learners who have presumably completed their pronunciation learning phase.

Keywords

L2 pronunciation, phonology, phonological transfer, fossilisation, cross-linguistic influence.