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Assessing the Role of Selective Fossilization Hypothesis in Determining Fossilizable Phonetic Errors in Tunisian EFL Learners' Oral Output

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Abstract

Fossilization is said to be a distinctive characteristic of second language (L2) learning (Selinker, 1972, 1996; Han, 2004). It is the most pervasive among adult L2 learners (Han and Odlin, 2006). This linguistic phenomenon has been characterized by cessation of learning, even though the learner is exposed to frequent input. Based on the findings of the MA dissertation of the first researcher which is about 'phonetic fossilization' and where she conducted a longitudinal study, Han's Selective Fossilization Hypothesis (SFL) is used to analyze the obtained fossilized phonetic errors in relation to L1 markedness and L2 robustness with a particular focus on fossilized vowel sounds. This is an analytical model for identifying both acquisitional and fossilizable linguistic features based on learners' first language (L1) markedness and second language (L2) robustness. The article first gives an overview of the theory of Interlanguage and the phenomenon of fossilization. Then, it introduces SFL. This is an attempt to study fossilization scientifically. In other words, it tests the predictive power of a developed L1 Markedness and L2 Robustness rating scale based on Han's (2009) model. The present study has pedagogic implications; it is an opportunity to raise teachers' awareness on this common linguistic phenomenon.

Keywords: fossilization; vowel sounds longitudinal study; selective fossilization hypothesis.

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1 INTRODUCTION

The process of learning a second language is quite different from that of a first language. Bley Vroman (1989) points to the differences between these two processes, as follows: (i) lack of success, (ii) general failure, (iii) variation in success, (iv) variation in goal, (v) fossilization, (vi) indeterminate intuition, (vii) the importance of instruction, (viii) the need for negative evidence, and (ix) the role of affective factors such as anxiety and motivation (as cited in Han, 2009, p.141). Fossilization inevitably appears in the acquisition of a second or a foreign language. It is one of the characteristics of learners' linguistic systems. Fossilization is still a growing field of research. Therefore many questions should be raised, and many answers cannot be found. It was introduced by Selinker (1972) as one of the central characteristics of second language (L2) learning (Han, 2004; Selinker, 1996).

Despite the extensive literature on fossilization, there has been little explanation as to why certain linguistic features are prone to fossilization than others. The present study is an attempt to use Han's (2009, 2013) SFH to try to find an answer to this inquiry. The study also uses a longitudinal approach to determine fossilized vowel sounds in the speech of Tunisian EFL learners and to test the validity of Han's model. The results of this research have implications for L2 phonetics learning and teaching.

2 Literature Review

2.1 Interlanguage

The discussion of fossilization always needs a discussion of interlanguage. This theory is defined by Stern (1983) as follows: "the concept of interlanguage was suggested by Selinker in order to draw attention to the possibility that the learner's language can be regarded a distinct language variety or system with its own particular characteristics or rules" (p.125). As illustrated in the following figure, L2 learning is a non-linear and fragmentary process. It is characterized by fast progression of certain linguistic areas, slow movements of others. Han (2009) depicts this IL metaphorically as follows: "interlanguage is metaphorically a halfway house between the first language (L1) and the TL, hence 'inter'. The L1 is purportedly the source language that provides the initial building materials to be gradually blended with materials taken from TL, resulting in new forms that are neither in the L1 nor in the TL" (p.137).

As presented in Figure 1, IL is a continuum towards the Target Language (TL). Selinker (1972) provides five central processes of IL. These include Language transfer, the transfer of training, strategies of second language learning, strategies of second language communication, and overgeneralization of target language linguistic material. According to Selinker (1972), these processes can affect the acquisition of TL.

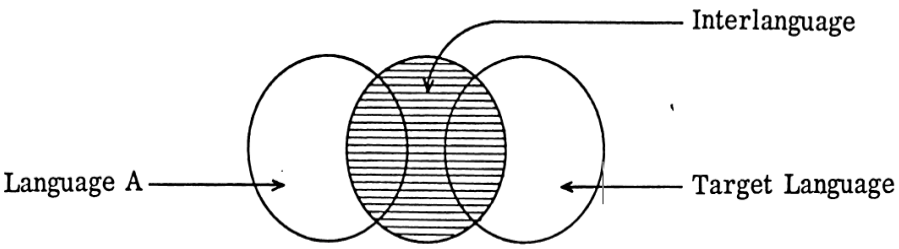

Figure 1. Interlanguage Diagram (Corder, 1976, p.151).

These processes can prevent learners from acquiring native-like competence. According to Schwartz (1997), most adult second language learners never acquire a second or a foreign language, and their ILs can cease to develop at a certain stage. This cessation of learning is what linguists called fossilization.

2.2 Fossilization

According to Selinker (1992), "the notion of 'Fossilization' dates back to scholars such as Weinreich 1953 and Nemser 1971. Weinreich, for example, talked about 'Permanent Grammatical Influence' (...) and Nemser about 'Permanent Intermediate Systems and Subsystems' ". Selinker (1996) defines fossilization as "a process whereby the learner creates a cessation of interlanguage learning, thus stopping the interlanguage from developing..." (as cited in Han, 2004, p.15). Selinker (1992) further clarifies this concept, stating that " fossilizable linguistic phenomena are linguistic items, rules, and subsystems which speakers of a particular L1 tend to keep in their IL relative to a particular TL, no matter what the age of the learner or the amount of instruction he receives in the TL" (p. 215). Moreover, Hyltenstam (1988) defines fossilization as a phenomenon that occurs in L2 acquisition. It refers to the deviation from native-speaker norms and the permanent cessation of learners' linguistic system (p.68).

It seems that there is a general agreement on the definition of fossilization. According to the cited definitions, fossilization is a linguistic phenomenon that occurs in second language acquisition to refer to the permanent cessation of learners' linguistic system over time. Learners' IL becomes stable, fixed, and unchanging. Han (2009) defines it as "an interlanguage-unique phenomenon in which a semi-developed linguistic form or construction shows permanent resistance to environmental influence and thus fails to progress towards the target" (p.133).

2.3 Selective Fossilization Hypothesis

The concept of fossilization raises many questions. Selinker and Lamendella (1978) went on to ask: (1) Which aspects of a learner's IL are susceptible to fossilization? Single surface items? Particular rules? Subsystems? The entire IL? (2) Are some linguistic features more susceptible to premature stabilization than others? In particular, is phonology in adults especially liable to fossilize before TL norms are attained? (3) Is it reasonable to view linguistic features that are 'correct' (relative to the TL) as being susceptible to fossilization, or is it only 'incorrect' features which should be considered fossilizable? (4) Can communicative competence in TL interactions fossilize independently of the linguistic form of the IL? Can linguistic form fossilize independently of communicative competence? (p. 149). The questions revolve around the nature of fossilization. They open a debate about the difference between the fossilized features and the learnable features.

The question which can summarize the above inquiries is what linguistic features in a second language are susceptible to fossilization? Or, why are certain linguistic features in

a second language more prone to fossilization than others? To answer this question, Han (2009, p.147) proposed a fossilization hypothesis as follows: SFH: A linguistic feature F of L2 has a greater possibility of fossilization if (a) It is non-robust (infrequent and variable). (b) Another linguistic feature F' of L2, an equivalent to F, if any exists, is unmarked (frequent and invariable).

Han (2009) suggests the SFH as an analytical model to study fossilization and to test the influence of L1 and the effect of L2 input. Han's (2009) hypothesis claims L1 markedness and L2 input robustness determine the fossilizability (and learnability) of an L2 feature. Platon (2013) clarifies the idea more:

Han proposed the term Selective Fossilization Hypothesis in her paper Interlanguage and Fossilization: Towards an Analytical Model. In this paper, Han mentioned two frequently and extensively cited causal factors of fossilization: L1 interference and satisfaction of communicative needs. She argued that first language markedness and second language robustness are determinants of selective Fossilization. Granting the default presence of UG in L2 Acquisition, it may further be hypothesized that the selectivity of acquisition (and for that matter, fossilization) depends largely (a) on the status of the L1 feature, and (b) on the nature of the input … (p. 143)

The following figure presents Han's hypothesis. It shows the zones of acquisition and fossilization. It also shows the interaction between the two central variables, namely L1 markedness and L2 robustness.

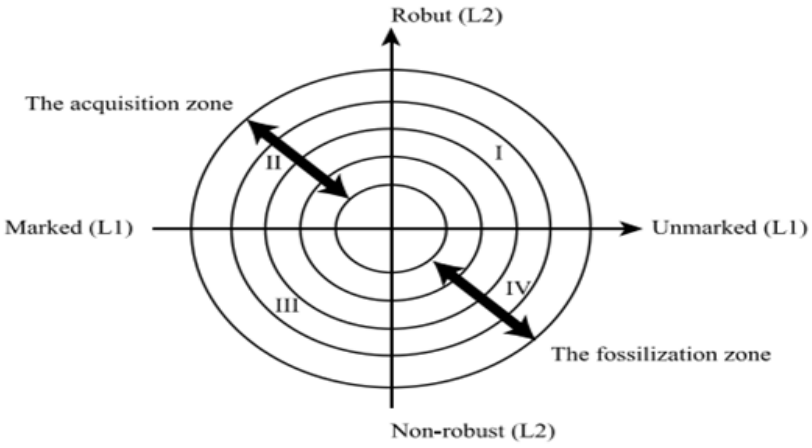

Figure 2. The Selective Fossilization Hypothesis (Han, 2013, p.147).

As shown in Figure 2, it seems clear that the interaction between L1 markedness and L2 input robustness are presented in four types: Type I, where the L1 is unmarked and the L2 input robust; Type II, where the L2 input is robust, and the L1 marked; Type III, where the L1 is marked and the L2 input non-robust; and Type IV, where the L2 input is non-robust and the L1 unmarked (Han, 2013, p.147). According to Han (2009), IV and II are zones of fossilization and acquisition, respectively. I and III are known as 'grey areas' where either fossilization or acquisition may occur, and this is based on the nature of the interaction between the two major variables of L1 markedness and L2 input robustness.

2.4 Previous Studies on Phonetic Fossilization

Second language researchers have focused on studying phonological fossilization. Demirezen (2005, 2008, 2010, 2017), for example, investigated the Turkish context, and he has reported many fossilized vowel sounds. Demirezen (2008) studied the fossilized pronunciation of the /æ/ phoneme. This phoneme presents a problem for Turkish English

language students. The results demonstrate that Turkish English learners tend to pronounce /ʌ/ sound in place of /æ/ sound. This can be explained by the absence of the latter in their native language. Similarly, Demirezen (2005a) also carried out a study on the fossilized pronunciation of /v/ and /w/ sounds. Based on the results, Turkish teachers and trainees use the /w/ sound as /v/ sound. This is due to the transfer of their native language.

Demirezen (2005b), moreover, claimed that /ɔ/ and /ow/ sounds have always been a fossilized mistake for Turkish students of the English language. The factors behind this problem are the absence of pronunciation teaching methods and the absence of courses in phonetics, phonology, and intonation. Furthermore, Demirezen (2010) tried to observe the difficulties in articulating the schwa sound. The subjects of the study were 81 students from Hacettepe University, Ankara. The findings indicate that Turkish students fossilized /e/ and /ʊ/ sounds in the place of the schwa sound. The fossilization of the schwa sound is attributed to NL interference and the lack of awareness.

Demirezen (2017) studied the fossilized pronunciation of /æ/ and /a/ sounds. The researcher claims that these fossilized sounds represent the greatest problem for most Turkish majors of English. Kahraman (2012) also studied the fossilized pronunciation of the vowel phoneme /æ/ and the possible solutions to overcome fossilization. Most Turkish learners of English in this study articulate /æ/ sound as /e/. They also make confusion between the mid-back unrounded vowel phoneme /ʌ/ and the front low spread vowel /æ/.

In another study of Turkish students, Hişmanoğlu (2007) investigated the pronunciation of the/ɔ: / and /ɔ/ sounds in the speech of Turkish learners of English. The study indicates that the participants tend to pronounce /oʊ/ in place of /ɔ: / and /ɔ/ sounds and this pronunciation becomes fossilized because the /oʊ/ sound exists in the native language of the subjects. To remedy fossilization, Hişmanoğlu (2007) proposes the use of the audio-articulation method. He presents many activities that can help Turkish learners get rid of their fossilization.

In line with what has already been stated, Zhang and Yin (2009) investigated the pronunciation problems of English learners in China. The results show that Chinese learners of English fossilized many sounds in the place of the target sounds. The researchers argue that phonological fossilization is due to the difference between the place and the manner of articulation of both languages. For example, the sounds /r/ and /ʃ/ are totally different from the Chinese /sh/ and /r/. Fossilization is also the result of Chinese language interference, insufficient knowledge of English phonetics and phonology, and other factors, including age and attitude (p. 141).

The studies reviewed so far have demonstrated the existence of phonetic fossilization in the speech of the participants, and they identified some fossilized sounds. However, the question which is worth being raised here revolves around the methodology they used to confirm the existence of persistent errors. It is difficult to prove fossilization without investigating learners' linguistic system overtime.

More recently, Senowarsito and Ardini (2019) have explored the phonological fossilization of Javanese EFL Learners. They try to show the influence of phonological and orthographic systems of the native language on the phonological fossilization of English. The participants of the study were 25 fourth-semester university students. The results show that Javanese learners of English tend to omit '/θ/, /d/ and /t/'in final position, 'consonant clusters in initial, mid, final position', and /j/ after plosive bilabial'. Phonological fossilization appears in continuous speech rather than isolated words, when they pronounced vowels /æ/, /ɪ/, /ʌ/, /i:/ in initial and middle positions. Those persistent phonological errors are attributed to the influence of the phonological and orthographic systems of their mother tongue.

In a similar research vein, Du (2018) analyzed phonetic fossilization in Chinese Students' English Interlanguage. The subjects of the study were 32 undergraduates majoring in English in a college in China. Based on the results, twelve students fossilized /ð/ in the word then as /z/, five students fossilized /v/ in the word never as /w/, and fifteen students pronounce /θ/ in the word thirteen as /s/, etc.

Yakout and Amel (2019) conducted a study on the fossilized pronunciation of the voiceless dental fricative, and the voiced dental fricative sounds in the speech of first-year EFL Students from Tahri Mohamed University, Bechar, Algeria. The informants were 20 students. The results showed that the students tend o use the /t/ and /d/ sounds instead of / θ/ and / ð /. Mother tongue and the lack of professional instruction are attributed to fossilization.

In the Tunisian context, many studies have been conducted to investigate phonetic fossilization. Rahal (2014) examined the IL of 5 English students from the department of English of Gafsa, Tunisia, to try to show the fossilized pronunciation of the schwa sound. The result of the research shows that the participants fossilized /e/, /ɔ: / and /a: / sounds in place of the schwa sound. The result also reveals that fossilization is due to L1 interference, the inconsistency of English vowels, and insufficient knowledge of the production of the English sound system.

Though the results of Rahal's (2014) study demonstrated the fossilized pronunciation of the schwa sound in the speech of Tunisian students, a methodological issue should be highlighted. The investigation is based on a longitudinal study of three months. The period of the investigation is short and cannot provide any evidence of long-term changes.

Recently, Rahal (2016) has reported on a longitudinal study that investigated the fossilized pronunciation of 20 students from the English department of Kairouan, Tunisia, over eighteen months. The study shows that the subjects committed some errors in times 1, 2, and 3. The longitudinal study concludes that there are errors that disappeared, and there are many errors that repeated in times 2 and 3.

Based on the findings, phonetic fossilization is the result of many factors, including NL interference, L1 transfer, the inconsistency of English vowels, limited exposure to L2 environment, insufficient corrective feedback, and insufficient knowledge of the production of English sounds. The study also highlights some solutions to remedy fossilization, such as the use of dictionaries to check the phonetic transcription, the adoption of new teaching methods, the integration of technology in teaching pronunciation, and sufficient corrective feedback.

Similarly, Smaoui and Rahal (2015) carried out a study on the fossilized pronunciation of the /3:/ sound in the speech of 10 intermediate Tunisian English students from the department of English of Kairouan, Tunisia. The result demonstrates that most of the subjects fossilized the /ɔ: / sound in place of the /3:/ sound. The findings conclude that fossilization can be attributed to the effect of French sounds, limited exposure to L2 environment, and lack of practice. The audio-articulation method is introduced as a way to overcome this linguistic barrier.

Although Smaoui and Rahal (2015) and Rahal (2016) investigated Tunisian students' ILs longitudinally, the studies still have their limitations. Their studies mainly focused on segmental features of pronunciation, including consonant sounds and vowel sounds, and they neglected supra-segmental features of pronunciation, such as intonation, stress, etc. Both features play an important role in creating the global sounds of a language.

It is worth noting that the reviewed studies have demonstrated that L2 learners cannot achieve native-like competence due to the persistent errors that remained stable in their ILs overtime. However, some researchers (e.g., Ricard, 1986) argue that learners' IL can stop developing at a certain stage. Still, after sufficient input and corrective feedback, learners can acquire target forms or rules. Ricard (1986) states that "students who have

been speaking English for years can go beyond fossilized pronunciation habits" (p.249).

3 Methodology

The informants of the study were 20 students from the Department of English at the Faculty of Letters and Humanities of Kairouan, Tunisia. Their age varied from 20 to 26. Their native language is Arabic. French is the L1, and English is the TL in the present study. The participants were English students. They were enrolled in first, second, and third years. They attended regular courses in English linguistics, including phonetics and phonology, English literature, and civilization. The main purpose of this study, which is a follow-up to an initial study, is to find out whether the SFH could account for the persistent pronunciation in the speech of EFL learners. This study is based on the findings of the MA dissertation of the first researcher, which is about phonetic fossilization. It focuses on the fossilized pronunciation of vowel sounds in the speech of advanced Tunisian English students.

This is a longitudinal study that was conducted between 2013 and 2015. It consists of three phases: time one, time two, and time three. The researcher recorded data on time one and then on times two and three. The aim was to identify the mispronunciation of vowel sounds. The researcher asked the same participants to pronounce the same list of words three times. The program of 'audacity' was used to record the data, and EXCEL was used for calculation. The study also consists of two stages. The first stage is the identification of errors in the recordings of the participants. In this stage, the researcher tried to identify common errors. The purpose of the second stage is to see if the committed errors would reappear or they disappeared and if L1 markedness and L2 input robustness could account for the persistence of those errors.

To test the predictive power of the SFH, Platon's (2013), the markedness of L1, and the robustness of the L2 (M1R2) rating scale were used. This scale is based on Han's (2013) prognosis of fossilization. The following table presents the main idea of Han's hypothesis:

Table 1.
Prognosis of fossilization concerning L1 markedness and L2 robustness

Prognosis	L1	L2
Fossilizable	Unmarked	Non-robust
Learnable	Marked	Robust

According to Han (2013) and as shown in Table 1, when L1 is unmarked, and L2 is non-robust, L2 forms are fossilized. But when L1 is marked, and L2 is robust, L2 forms are learnable. This hypothesis claims that fossilization or acquisition is the result of the interaction between L1 markedness and L2 input robustness. In this study, we investigate the frequency and variability of the same vowel sound errors from the three times. For example, if error X appears in time 1 and reoccurs in times 2 and 3 following exposure to regular courses in English, error X is indeed fossilizable. Frequency and variability are defined by Han (2013), as follows: "The frequency variable captures the quantitative property of a given usage either in the L1 or the TL, and the variability variable the inherent relationship between the linguistic form, its semantics, and pragmatics, or, simply, form-meaning-function mapping (FMF) in a given linguistic usage" (p. 145).

It is worth noting that there is a close relationship between the theoretical background and the conceptual framework of this study. The IL analysis is used to identify fossilized errors based on the use of a longitudinal approach. The IL theory highlights the phenomenon of language learners' learning progress. It shows the development and change in learners' IL overtime. The use of the SFH, on the other hand, is used to analyze

the obtained results from the longitudinal study. This hypothesis tries to test the effect of L1 and the input on learners' acquisition of the target sounds.

4 Results

4.1 Results of the longitudinal study

4.1.1 Time 1

The result of the time one is presented in Figure 3. The participants made 160 vowel errors. They include short vowels, long vowels, and diphthongs.

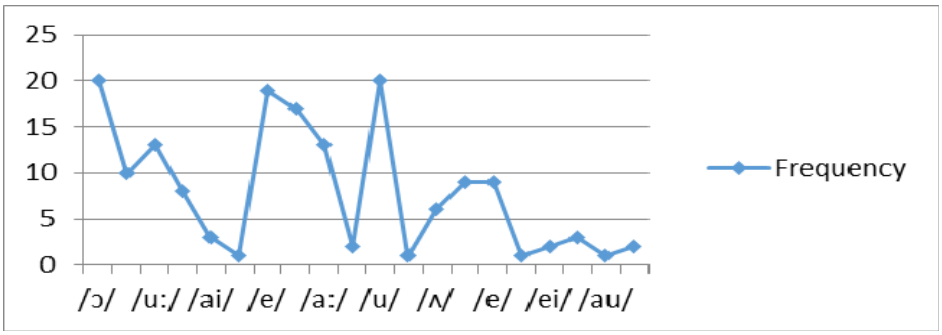

Figure 3. Error Frequency of Vowels in T1 (Rahal, 2016, p.50).

As shown in the figure above, the highest number is 20 errors, which include the use of /ɔ/ and /ʊ/ in place of the schwa sound. The lowest number is 1 error, which includes the use of /ai/ sound in place of the /i/ sound, the use of /i: / sound instead of the short /i/ sound, the use of /a:/ sound in place of /ei/ sound and the use of /aʊ/ sound instead of the /ʌ/ sound. It seems clear that the schwa sound is the most common error among the participants. It is manifested in the use of /ɔ/, /e/, /ei/, /a: / and /ʊ/ sounds in place of /ə/ sound.

The mispronunciation of the schwa sound is the result of the influence of L1 interference. French has its influence on the pronunciation of the participants. L1, therefore, functions as "the source language that provides the initial building materials to be gradually blended with materials taken from the TL [target language]" (Han, 2009, p. 137). There are also mispronounced vowel sounds due to the inconsistency of the English vowel system. This factor can be the result of limited courses in phonetics.

4.1.2 Time 2

T2 is shown in the following figure. The figure indicates that the participants made 145 errors.

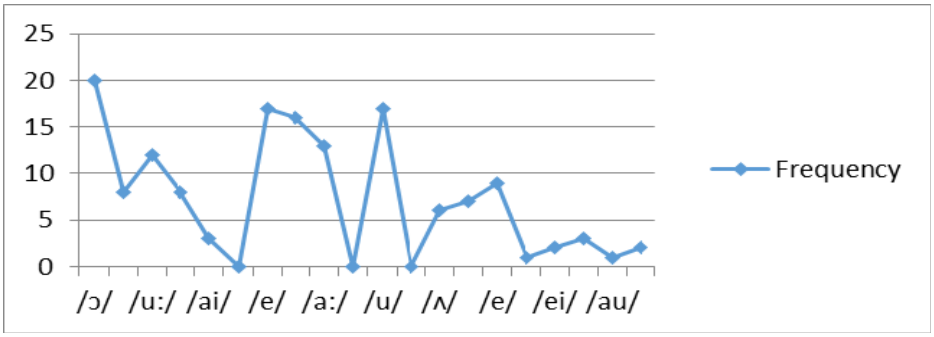

Figure 4. Error Frequency of Vowels in T2 (Rahal, 2016, p. 52)

Based on the results of T2, the highest number is 20 errors, which include the use of /ɔ/ sound in place of /ə/ sound. The lowest number is 1 error, which involves the use of /a:/ sound in place of /ei/ sound and the use of /aʊ/ sound instead of /ʌ/ sound.

As indicated in Figure 4, six errors decreased in T2. These include the use of /ɔ/ in place of /3:/, /ʊ: / in place of /ʊ/, /e/ in place of /ə/, /ei/ in place of /ə/, /ʊ/ in place of /ʌ/ and /a:/ in place of /æ/. There are also three errors that disappeared, which are as follows: The use of /ai/ in place of /i/, /i/ in place of /ai/ and /i: / in place of /i/.And, the rest of the errors repeated with the same frequencies.

It is worth noting that the repeated errors in T2 can be considered as evidence of fossilization. The influence of the L1 and the inconsistency of English vowels are the main reasons behind the persistence of these errors. It appears that L1 plays an important role in shaping the acquisition of the target sounds. The inconsistency of the English vowel system affects the participants' IL. Kelly (2000) states that "the lack of a simple correspondence between the spelling system and the pronunciation system in English tends to cause problems for learners in that it can lead them to initially or repeatedly misspell words and mispronounce them" (p.125). It seems that some of the subjects acquired wrong sounds, and they did not receive sufficient input and corrective feedback.

4.1.3 Time 3

As presented in the following figure, the subjects made 144 errors in T3:

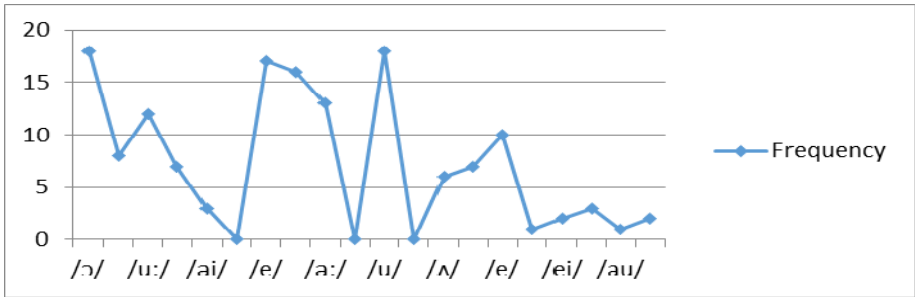

Figure 5. Error Frequency of Vowels in T3 (Rahal, 2016, p.53).

The highest number of errors is 18, which involves the use of /ɔ/ sound in place of /ə/ sound. The lowest number is 2 errors, and they include the use of /a: / in place of /ei/ and the use of /au/ in place of /ʌ/. As it is shown in the figure, two errors decreased, two errors increased and the rest of the errors repeated in T3 with the same frequencies. In time 3, the repeated errors are due to the same factors mentioned above, including L1

interference and insufficient input.

4.1.4 Comparison between Times 1, 2 and 3

The following figure presents a comparison between times 1, 2, and 3 of the longitudinal study. The purpose of the comparison is to give a clear picture of the disappeared errors, the decreased errors, and the fossilized errors.

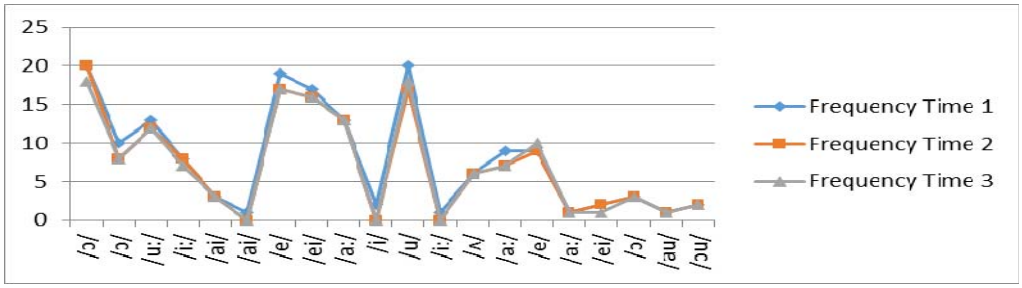

Figure 6. Comparison of Error Frequency of vowels in T1, T2 and T3 (Rahal, 2016, p. 55).

According to Figure 6, there are 17 fossilized vowel sounds. There are 8 fossilized vowel sounds that repeated in times 2 and 3 with the same frequencies, including /ai/ in place of /i/, /a:/ in place of /ə/, /ʌ/ in place of /i/, /a:/ in place of /ei/, /ei/ in place of /a:/ and the use of /aʊ/, /ɔ/ and /ɔʊ/ in place of /ʌ/. Two fossilized vowel sounds increased in T3, basically the use of /e/ in place of /i/ increased from 9 errors to 10 errors and the use of /ʊ/ in place of /ə/ increased from 17 errors to 18 errors. And, 2 fossilized vowel errors decreased in T3. The comparison between the three times proves the existence of persistent vowel sounds. The results show that most of the fossilized vowel sounds are common among the participants. Fossilization becomes fixed and stable in their IL overtime.

4.2 Results of the SFH

According to the findings of the longitudinal study, there are many fossilized features in the speech of the participants. Rahal's (2016) results show that the main factors behind fossilization are L1 (French) transfer, insufficient knowledge of English phonetics, and insufficient input. As presented in Table 2, these features are considered learnable in time 1 concerning the principles of the SFH, and they are fossilizable in times 2 and 3.

Table 2.
The results of Selective Fossilization Hypothesis

Vowel Sounds	Markedness	Robustness	Fossilization or Acquisition
Time 1	M	R	Learnable
Time 2	UM	QNR	Fossilizable
Time 3	UM	QNR	Fossilizable

Based on the results presented above, in French, which is considered as the first language of the participants in this study, these features are used frequently. This means that the L1 influence is frequent and invariable and, therefore, unmarked. These features also seem to be frequent yet variable. This indicates that the input is not completely robust. Overall, the features are unmarked in L1 and quit non-robust in the TL. They are

likely to be fossilized.

For example, the schwa sound is one of the fossilized vowel sounds. The participants replace it with /ɔ /, /e/, /a: /sounds. These features are frequent and variable in French, and the L2 input is quite robust since the participants believe that their fossilization is due to insufficient input and insufficient feedback.

This result is in line with Han (2009)'s finding. Based on a cross-sectional study of 'pro-drop parameters of L2 acquisition of English', Han (2009) finds that one of the fossilized errors of Spanish and French learners is the omission of subject pronouns. She further argues that:

The presence of the category pro in L1 (Spanish) is quite unmarked, that is to say, frequent yet variable to a considerable extent since Spanish allows non-omission of subject pronouns, and the L2 input (English) quite robust viz., frequent but somewhat variable, since in informal English, one may occasionally encounter utterances containing ellipsis that omits subject-pronoun such as Hope you are well. (p. 134)

The following table presents the comparison between the results of the longitudinal study and that of M1R2 scale:

Table 3.
Comparison between the Longitudinal Study and the M1R2 Scale results

Vowel Sounds	Longitudinal Study	M1R2 Scale
Time 1	Fossilizable	Learnable
Time 2	Fossilizable	Fossilizable
Time 3	Fossilizable	Fossilizable

In light of the results, the longitudinal study demonstrates the existence of fossilization in the three times. Time 1 is considered fossilizable unless proven otherwise. According to the M1R2 scale, Time 1 is predicted to be learnable, while times 2 and 3 are fossilizable. The status of Time 1 has a lesser possibility to be fossilized as compared to times 2 and 3 because the obtained features seem to be common features among most of the participants. Another explanation for why Time 1 is predicted to be learnable is that some of the fossilized features are tolerable. Overall, it is obvious that the longitudinal study collaborates with the finding of the M1R2 in times 2 and 3 but not in time1.

5 Discussion

The present study focuses on investigating the fossilized pronunciation of the vowel sounds, and more specifically, it is an attempt to test the predictive power of the SFH concerning the persistent vowel sounds. The reason for studying fossilization refers to the fact that it becomes a common phenomenon among learners and teachers (Demirezen, 2008). Moreover, the investigation of learners' fossilized errors is also a tool to increase the understanding of the process of learning. Raising awareness is another reason for studying this linguistic issue. In this regard, Tahereen (2015) states that "Learners' awareness is very important in developing good pronunciation" (p.13).

At the methodological level, the study opts for the longitudinal approach because it is a valuable tool to study the development of learners' IL over time and to analyze changes that occur. This approach also gives a detailed description of linguistic performance at different points of time. The use of SFH, on the other hand, offers a scientific way to move the problem of fossilization in L2 learning "beyond its hitherto primarily argumentative basis" and to "a more tangible and precise understanding" (Han, 2009, pp. 157-158).

The result of the study, which shows the reviewed studies confirm the existence of fossilization. Learners' IL can be characterized by a permanent cessation that prevents

them from acquiring the target forms and sounds. However, there is a need for more solid evidence to confirm this permanent stop of learning because some researchers (e.g., Graham, 1981) believe that it can be a temporary cessation. He argues that "most students can modify the rules of their Interlanguage so much more efficiently if they are given clear presentations of the rules of the target language" (p.12).

Motivated by what Han and Odlin (2006) point out "not only has there been a continuous paucity of evidence, but the existing evidence is also suspect, due to various conceptual and methodological shortcomings" (p.5), It is worth noting that this study tries to find a solution for methodological shortcomings in studies of fossilization. It tries to investigate fossilization scientifically and to provide more scientific evidence. Nevertheless, SFH is not scientific. It is a complex hypothesis.

The study still has its limitation. Its findings cannot be generalized to all EFL students because the population chosen was limited to 20 students. This study is also limited to exploring fossilized vowel sounds. Future studies can focus on both segmental and suprasegmental features of pronunciation. It is also recommended that testing the different linguistic features is essential to prove the validity of the SFH. More rating scales are needed to validate this hypothesis. Furthermore, longitudinal studies over 2 to 5 years are essential to show the existence of fossilization (Long, 2003, cited in Han, 2009, p.150).

Therefore, there have been many criticisms against SFH. Research in SFH is still in a nascent stage, and there is no valid scale to test this hypothesis. Moreover, SFH appears to be vague; there are no criteria for determining the frequency and variability of a particular linguistic feature. Another limitation refers to the fact that fossilization is a product of different factors, and thus only L1 influence, and the input cannot explain its existence. There are different factors of fossilization. Han (2004) outlines the causes of fossilization, and she classifies them into two main groups, namely internal and external causes. Internal causes, on the one hand, include cognitive, neurobiological, and socio-affective factors. External factors, on the other hand, involve the absence of corrective feedback, the lack of written input, the lack of instruction, the lack of communicative relevance, and language complexity (p. 29).

The findings of this research have some practical implications. Theoretically, the findings will enable researchers and teachers of English to gain deeper insights into the fossilization phenomenon and its selective fossilizable characteristics. The present research demonstrates the importance of teaching pronunciation. Pronunciation must be an essential subject in the teaching curriculum. In this context, Tench (1981) maintains that "Pronunciation is not an optional extra for the language learner, any more than grammar, vocabulary or any other aspect of language is. If a learner's general aim is to talk intelligibly to others in another language, a reasonable pronunciation is important" (cited in Maniruzzaman, 2005, p.1).

Pedagogically, the results will be useful for teachers to design curricula that address the prevention of fossilization. It will enable teachers "to set more realistic goals for instruction, to develop more focused curricula, to fine-tune input to be provided to the learner, and to respond to learner output in a more effective manner" (Finneran and Lew, 2009, p.3). Based on the findings of the study, teachers can adopt different teaching to help their learners overcome phonetic fossilization.

At the practical level, there are some suggested methods to destabilize phonetic errors. The known method is the audio-articulation model. It was proposed by Demirezen (2005). This method is considered as "a fossilized eraser" (Kahraman, 2013, p.269). It is used to help students improve their pronunciation skills and avoid phonetic fossilization. This method includes different activities, such as minimal pairs, tongue twisters, aural recognition exercises, and sentences contextual clues.

6 Conclusion

The findings of the study show that Tunisian EFL students fossilized some vowel sounds. It seems that the claim which supports the existence of fossilization in the speech of EFL students is evident. The results support this claim and have compelling evidence from a hypothesis to facts. The purpose of both the longitudinal study and the SFH is to prove the existence of phonetic fossilization. However, it is also important to investigate the learnability of particular vowel sounds. SFH is also about learnability. It can be used to test and validate errors that disappeared or decreased.

In the current study, the SFH is used to test the power of L1 markedness and L2 robustness in determining fossilized vowel sounds. However, this model has its limitations. It is not clear how much frequency or variability makes a feature frequent or variable. Han's definition of frequency and variability is vague. Moreover, SFH focuses on L1 influence and the role of the input, and it ignores other factors, such as motivation and learners' communicative needs.

Future research should give more emphasis on learners' errors. Selinker (1996) argues that "errors are indispensable to learners since the making of errors can be regarded as a device the learner uses to learn" (p.150). It is also quite worthy of conducting more empirical studies to analyze IL fossilization and test Han's hypothesis.

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