Volume 2, Issue 3, December 2020, p.
21-43 İstanbul / Türkiye

Article Information

Article Type: *Research Article*

This article was checked by iThenticate.

Article History:
Received
14/04/2020
Received in revised form
20/04/2020
Accepted
21/05/2020

AN OPTIMALITY-THEORETIC ACCOUNT OF THE ACQUISITION OF ENGLISH DIPHTHONGS: THE CASE OF MOROCCAN EFL LEARNERS

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Abstract

This paper reports on Moroccan EFL learners' acquisition of English diphthongs. It uses the Constraint Demotion Algorithm (CDA henceforth) (Tesar & Smolensky, 1998, 2000) to examine the role of cross-linguistic influence on the acquisition of this particular aspect. Ninety-six Moroccan learners participated in the study. They were evenly divided accross three academic levels: Baccalaureate, Second Year University, and Master's. The participants completed an oral multiple-choice test that elicited their intuition about the various English diphthongs. The main finding of this study is that learners´ prior linguistic knowledge impacts their acquisition of English diphthongs. Learners tend to fluctuate between the French and the Arabic hierarchy before they were able to converge to the English one. Besides, the results suggest an influential role of academic level as learners' pronunciation errors were shown to diminish progressively as they climb the academic ladder.

Keywords: English diphthongs, Cross-Linguistic Influence, Optimality Theory, Constraint Demotion Algorithm, Moroccan EFL learners.

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Introduction

Second language (L2[2]) phonology has fascinated linguists, teachers, and practitioners alike. Over the past few decades, studies on L2 phonology have blossomed as scholars came to terms with the importance of "proper" pronunciation in achieving effective acquisition (see Eckman, 2004 for a review). Among the L2 literature, studies have demonstrated that L2 adult learners struggle tremendously when acquiring L2 sounds. Besides, there is now abundant evidence that the challenges are greatly due to the influence of learners' mother tongue (L1) on the acquisition of L2 features (e.g. Flege, 2003; Piske, Mackay & Flege, 2001).

Despite the growing interest in the acquisition of L2 sounds, the body of studies in the Moroccan context remains scarce and limited. The present study, therefore, comes in an effort to level up the shortage at the level of phonological acquisition. Concretely, this study attempts to account for the acquisition of English diphthongs among Moroccan EFL learners. It is an extension of the analysis presented in Zouiten (in press) with the aim to uncover the role of learners' prior linguistic knowledge on the acquisition of this particular aspect. English is a third language for Moroccan learners, its acquisition occurs only after the acquisition of L1 Moroccan Arabic (MA) and L2 Modern Standard Arabic (MSA) and French is achieved.

In multilingual settings, like Morocco, the scenarios of cross-linguistic influence (CLI) are multiple as there is more than one potential source language. This situation gave rise to different postulates about the origin CLI among multilingual learners. The Full transfer/full access hypothesis (Ritchie, 1978; Liceras, 1985; Phinney, 1987; Schwartz & Sprouse, 1994, 1996), for instance, argues for the role of L1 in the acquisition of any subsequent L2. In their view, L2 is mediated through L1. In sharp opposition, the "L2 status" (Flynn, Foley, & Vinnitskaya, 2004; Leung, 2005; Bardel & Falk, 2007, 2010, 2012) claims transfer from Learners′ L2 rather than their L1. Finally, the Typological Primacy Model (TPM)

[2] The present study kept in line with the North-American tradition in using L2 to refer to any language that is acquired after L1. Nevertheless, English will occasionally be referred to as L3 especially when comparing it to L2 French or Modern Standard Arabic.

(Rothman, 2010, 2011) argues for the role of all previously learnt languages either by aiding the process or remaining neutral. The investigation of the interaction of English, French, and Arabic in Moroccan EFL learners' interlanguage (IL hereafter) could reveal interesting findings on the role of transfer on the one hand and the different stages of L2 phonological acquisition on the other.

Diphthongs in English, Arabic and French

Diphthongs are complex phonemes containing two distinct vocalic elements, but felt to function as a single phonological unit (Gimson & Cruttenden, 1994). The first element of the diphthong is said to be longer and more prominent than the second element (Jones, 1978; Langedoen, 1982; O'connor, 1983; Roach, 2000; McMahon, 2002). In Moraic phonology, diphthongs have two morae attached to them (Hyams, 1985; McCarthy & Prince, 1986; Hayes, 1989).

English[3], known for its rich vocalic system, hosts eight diphthongs (Kelly, 2000; Roach, 2010). The diphthongs in English are either centering or closing. Closing (also called falling) are cross-linguistically the most common type of diphthongs. They typically start with a low vowel /a/ and move to the upper corners toward /ɪ/ or /ʊ/. English has five closing diphthongs: three ending in /ɪ/ as in [taɪm] (time), [weɪt] (wait), and [bɔɪ] (boy) and two ending in /ʊ/ as in [baʊnd] and [nəʊ] (no). Besides closing diphthongs, English has three centering diphthongs: /ɪə/, /eə/, and /ʊə/. They are diphthongs where the off-gliding vowel is a schwa and they appear in words like [hɪə(r)] (here), [heə(r)] (hair), and [kjʊə(r)] (cure).

Arabic[4], both MSA and MA, has only two closing diphthongs, /ai/ and /aw/, that are similar to those of English (Ennaji, Makhoukh, Es-saiydy, Moubtassime & Slaoui, 2004). The Arabic diphthongs appear in the medial (MSA [nawm] (sleep), [ʕain] (eye); MA: [ħawli] (sheep), [blaiS] (places)) and final positions (MSA [law] (if), [kai] (so); MA: [DDaw] (light)). The diphthongs in medial position should be immediately followed by a

[3] Due to the instabilities of some diphthongs accross English dialects, the description assumed here relates to British English as being the most common English target used in educational systems of Arab countries where English is taught as a foreign language.

[4] Since Moroccan Arabic (MA) and Modern Standard Arabic (MSA) are similar in their use of diphthongs, "Arabic" will be used as a cover term to refer to both.

consonant; otherwise, they will not be considered as a diphthong but rather a sequence of vowel and semi-vowel, each belonging to a different syllable.

Unlike English and Arabic, French "Does not have a single diphthong anymore and there is no trace of diphthongization tendency" (Vaissiére, 1996:67). Historically, the evolution from Latin to Modern French has been marked by a general tendency of monophthongization of all diphthongs and thriphthongs. As such, the diphthong [oe] and [ae] in words like [poena] (pain) and [caelum] (sky) reduced to /ɛ/ to become [pɛn] and [sjɛl] respectively. In the same fashion, the diphthong /ie/, /uo/, /ae/, /ei/, and /ou/ have all been subject to monophthongization (see Straka, 1979; Vaissiére, 1996; Loporcaro, 2015 for an insightful analysis of this trend). Some scholars consider that the sequence glide+vowel ([jV] in a word like [pjɛ] (foot)) as a rising diphthong. Nevertheless, the present study subscribes to Dell's (1995) view that argues that French Rimes are only occupied by two positions, i.e. two morae: either a simple vowel+ a coda or a long vowel attached to a single vocalic node. Accordingly, the glide /j/ in the word [pjɛ] (foot) or [sjɛl] (sky) is syllabified as a branching onset rather than a branching nucleus.

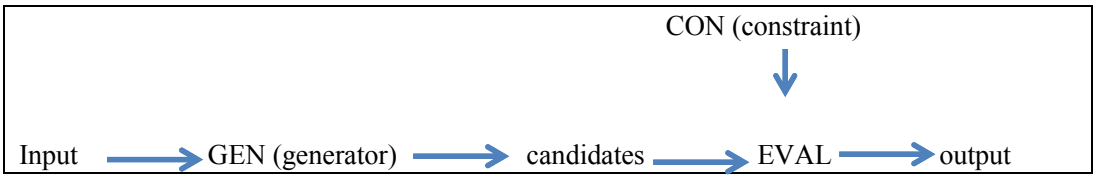
Although diphthongs are not totally alien to Moroccan EFL learners, given the fact that some English diphthongs have similar counterparts in Arabic, they may still face some difficulties in trying to achieve an acceptable pronunciation for various reasons. First, the manoeuvers involved in the production of diphthongs are challenging for any learner. Second, complex nuclei in general and diphthongs in particular challenge the universal CV syllable. Last, the mismatch between the target language English on one hand and the two potential source languages, Arabic and French, on the other may create learning challenges especially at early stages of acquisition. The up-coming section is a discussion of OT, the framework of the study.

Optimality Theory

OT (Prince & Smolensky, 1993; Kager, 1999; McCarthy & Prince, 2004) is a general approach to modeling Human linguistic knowledge that arose in

theoretical linguistics during the 1990s. It argues for the existence of a set of universal violable constraint on output well-formedness.

Table 1. Standard OT architecture.



CON component hosts two families of universal constraints: Markedness constraints, which militate against the occurrence of cross-linguistically marked structures, and faithfulness constraints which demand identity between input and output forms with regard to some specified property (Kager, 1999). These constraints, ranked in a particular order, determine which candidate is most harmonic/optimal. Besides being universal, constraints are strictly violable. Nonetheless, violation is never gratuitous in that the violation of a constraint is always compelled by the satisfaction of a higher ranked one.

In terms of learnability, the CDA (Tesar and Smolensky, 1998, 2000), one of the prominent learning algorithms within OT, explains the acquisition of L2 sounds in terms of reordering of existing constraints. According to this algorithm, learning starts by selecting an initial hierarchy. It has been well established in the OT literature that the initial state of L2 acquisition corresponds to the final state of L1. Subsequently, the Robust Interpretive parsing (RIP), maps the overt form learners perceive to a full structural description. The third and most important step of the algorithm is Grammar Learning. In this critical phase, learners attempt to deduce the constraint hierarchy of the target grammar based on evidence from constraint violation (Kager, 1999). The mechanism by which the algorithm operates is Constraint Demotion (CD) (Tesar, 1998, 1999, 2000; Tesar & Smolensky, 2000). Thus, Learners demote every winner-favoring constraint below some loser favoring constraint until all winner-favoring constraints are crucially dominated (op.cit). In the present study, the CDA will be used to provide a developmental account of the acquisition of English diphthongs among Moroccan EFL learners.

Method

Research questions

The present study addresses the following research questions that are directly related to the purpose of the investigation:

1. How do Moroccan EFL learners acquire English diphthongs?

2. How does learners' prior linguistic knowledge affect their acquisition of English diphthongs?

Research hypotheses:

The study sets two hypotheses that correspond to each of the aforementioned research questions:

1. The more academically advanced Moroccan learners are, the better their pronunciation of English diphthongs.

2. Moroccan EFL learners will transfer diphthong specifications at early stages of acquisition.

Participants

A total of ninety-six participants took part in this study. They were evenly divided across three academic levels: Baccalaureate, Second Year University (SYU, hereafter), and Master´s. The rationale behind the inclusion of the three aforementioned academic groups is to allow scope on the development of students, which in turn will allow us to measure the variable of acquisition over time. To ensure the homogeneity of the sample at hand, the three academic groups filled in a background questionnaire (see appendix 1) that guaranteed that they all share the same linguistic background. Thus, all participants have MA as L1 and MSA and French as simultaneous L2s. Also, There was no disparity among the participants with regard to the length of formal exposure to the English language.

Instruments and procedure

The study elicited learners' intuition about English diphthongs by means of a multiple-choice test (see appendix 2). The rationale behind this particular test relates to the authenticity of the data. The multiple-choice

test is believed to yield more spontaneous and authentic production of the target diphthongs since participants' attention will be directed towards the meaning of the words rather than their pronunciation. Hence, they will be more prone to provide random data. The test consisted of 34 multiple choice sentences with four corresponding choices each but only one correct answer. The correct answer for each sentence contains a target English diphthong with the exception of ten sentences. The latter were designed as distractors and included words with simple vowels. To ensure uniformity, the process of data collection was the same for the three groups. Participants in each academic group were split into sub-groups of eight students. Besides, the test was administered orally in that learners were asked to read loudly their answers while being recorded.

Data coding and analysis

The transcription and codification of the data was done by the researcher herself and was later checked by a trained transcriber. Participants were scored "1" for each correct pronunciation of the target diphthong and "0" for incorrect ones. Participant pronunciation of the adjacent sounds to the target diphthongs or even other words within the sentences is irrelevant for the analysis. Scores were, then, added to obtain a total out of twenty as ten sentences were designed as distractors. The data was analyzed by means of SPSS.

Results

The first hypothesis of the study examines the role, if any, of learners' academic level on the acquisition of English diphthongs. Before discussing the output of ANOVA, some descriptive are in order. The mean scores indicate that learners' academic level plays a pivotal role in the acquisition of English diphthongs. Thus, the more academically advanced learners are, the less errors they produce. The baccalaureate group and the master´s group represent the two extremes of the continuum with a mean score of (5.15) and (17.25) respectively. The SYU lays in the middle of the two groups with a mean score of (12.56) in English diphthongs. Pearson product-moment correlation analysis displayed a similar tendency. The results yielded a strong positive correlation between the independent variable, academic level, and the dependent one, English diphthongs. The

correlation coefficient with diphthongs is nearly perfect with a value of (.914) significant at (.00).

The output of ANOVA confirms the role of academic level in the acquisition of English diphthongs. The between-groups test reveals that the three academic groups differ significantly. ANOVA reports on an F-value of (261,22) significant at (.00). This is tantamount to the rejection of the null hypothesis that denies such differences. Not only does ANOVA provide evidence for the significance of academic level in the acquisition of English diphthongs among Moroccan EFL learners, but it also points to where this significance resides through the post-hoc test. The latter indicates that the difference concerns all the three academic groups.

The difference between the baccalaureate and the SYU group on their acquisition of diphthongs is significant at (.00). A similar significant difference (.00) holds between the baccalaureate group and the master´s group. The results, once again, assert that the initial state of acquisition is one that is heavily impacted by errors. The statistically significant difference (.00) between the SYU and the two other academic groups reveals two major tendencies. On the one hand, although errors related to the pronunciation of diphthongs still persist in SYU group IL, their pronunciation remains superior to that of the baccalaureate group. On the other hand, SYU learners are shown to be less successful when compared to the learners of the master´s group. The latter displayed a nearly perfect pronunciation of English diphthongs indicating that errors are eradicated at this stage of acquisition.

In a nutshell, this section concerned the statistical analysis of the acquisition of English diphthongs. The results of ANOVA together with the output of the correlation analysis confirm the influential role of academic level in the acquisition of English diphthongs.

Analysis and discussion

The present section provides an optimality-theoretic account for the results presented in the section above. By means of the CDA, it will attempt to examine the different stages of Moroccan EFL learners' IL. We

start our analysis by formulating the constraints responsible for the occurrence of diphthongs in any given language.

Constraints regulating the occurrence of Diphthongs (Rosenthall, 1994)

***DIPH:** Diphthongs are banned from output

MAX-μ V: Underlying mora associated with a vowel should be preserved in the output

*DIPH is a markedness constraint that militates against the occurrence of diphthongs in output forms. *DIPH interacts with the faithfulness constraint MAX-μ V, a constraint that penalizes the deletion of an underlying moraic node associated with a vowel. The presence of diphthongs in the English and Arabic phonemic inventory is the result of the markedness constraint *DIPH being crucially dominated by the faithfulness constraint MAX-μ V. Conversely, *DIPH dominates MAX-μV in the French hierarchy hence the absence of diphthongs.

At initial stages of acquisition, Moroccan learners fail to correctly pronounce English diphthongs be them closing or centering. In fact, the baccalaureate group was shown to monophthongize the relevant diphthongs in each of the target words presented. By way of illustration, the target diphthong in [əlaʊ] (allow), [breɪk] (break), and [sləʊ] (slow) were mispronounced as [alɔ], [brek], and [slɔ] respectively. Learners' errors indicate that they have transferred the wrong hierarchy into their IL. Given the fact that Arabic does have diphthongs, it stands to reason that the transferred hierarchy corresponds to that of French (Zouiten in press).

Within OT, the relevant candidates, constraints as well as their ranking are evaluated by means of a violation tableau. The input is placed in the highest left most cell whereas the possible output candidates are exposed vertically in no particular order. The relevant constraints are exposed horizontally in their strict domination order. Violation is indicated by means of an asterisk (*) while a blank cell signals the satisfaction of the constraint in question. An exclamation mark (!) is added next to the violation incurred by the suboptimal, loser candidate, in an indication of fatal violation. The manual indicator (☞), by contrasts, indicates the

favored candidate. Tableau (2) below exemplify how Moroccan learners' transfer the wrong hierarchy, that of French, at initial stages of acquisition.

Tableau 2. IL 1: Transfer of French ranking into English

/kɒmbaɪn/	*DIPH	MAX-μ V
☞a. Kombin		*
b. kɒmbaɪn	*!	

The French hierarchy favors a sub-optimal candidate that is ruled out by the target language. Tableau (2) indicates that although Candidate (a) violates MAX-μ V, it is still considered the optimal candidate in learners' IL since it satisfies *DIPH. Candidate (b), on the other hand, incurs a fatal violation of *DIPH and is, consequently, ruled out. At this stage of acquisition, Moroccan learners do not show any sign of moving toward the target language norms.

By the Second Year of University, learners come to realize that they are dealing with a complex vowel in the form of a diphthong. By the same token, they also realize that the transferred hierarchy does not optimize the correct output in the target language. This newly accessed evidence compels the learners to demote *DIPH below MAX-μ V, transforming the hierarchy from DIPH>> MAX-μ V to MAX-μ V >> *DIPH as shown in tableau (3).

Tableau 3. Demotion of *DIPH below MAX-μ V

/kɒmbaɪn/	*DIPH	MAX-μ V
☞a. kombɪn		*
b. kɒmbaɪn	*!	

The demotion of *DIPH below MAX-μ V optimizes candidate (b), rather than candidate (a), although the latter incurs a double violation of *DIPH. The result is a hierarchy that matches the English ranking with regard to the occurrence of English diphthongs.

Tableau 4. IL 1: Result of demotion of *DIPH below MAX-μ V

/kɒmbaɪn/	MAX-μ V	*DIPH
a. kombɪn	* !	
☞b. kɒmbaɪn		*

With the hierarchy obtained, one expects learners to face no difficulties in producing English diphthongs at this stage of acquisition. Unfortunately, this does not seem to be the case. The centering diphthongs /ɪə /, /eə/ and /ʊə/ in the target words [klɪə(r)] (clear), [ɛnɪweə(r)] (anywhere), and [kjʊə(r)] (cure) respectively are shown to be persistently challenging for SYU learners. Unlike the baccalaureate group, SYU did not resort to monophthongization to avoid the occurence of centering diphthongs. Rather, they chose to lengthen the equivalent of the first element of the diphthong concerned (e.g: [kari:r] (career), [kli:r] (clear)). The SYU erroneous pronunciation does not stem from their inability to perceive the existence of diphthongs in English as the demotion of *DIPH below MAX-μ V has already taken place. Rather, the errors mirror their failure to recognize the specifications of the diphthong involved.

While SYU learners' adequate production of closing diphthongs indicate that they have already dismissed the French hierarchy, their erroneous production of centering diphthongs indicate that they have not yet converged to the target hierarchy. This goes in tandem with the nature of the intermediate stage of acquisition that is marked with multiple fluctuations. In terms of hierarchy, it appears that SYU learners have transferred yet another hierarchy to their IL, that of Arabic. Nevertheless, it is unclear whether Moroccan learners transfer the MSA or MA as both languages share the same set of diphthongs. The constraints responsible for the mismatch between Arabic and English are explained below.

Constraints of centering diphthongs

***D $_{[+center]}$:** Centering diphthongs are prohibited

IDENT- IO: input and output diphthongs must be identical in terms of specification

.

The first constraint, *$D_{[+center]}$, is a markedness constraint that prohibits the occurrence of centering diphthongs. *$D_{[+center]}$ clashes with IDENT- IO, a faithfulness constraint that requires the diphthongs in the output to be identical to

the ones in the input in both quality and specification. Since English allows the occurrence of centering diphthongs, it follows that *D $_{[+center]}$ is crucially dominated by IDENT-IO. In Arabic, *D $_{[+center]}$ ranks higher in the hierarchy hence the absence of centering diphthongs from its phonemic inventory. Tableau (5) illustrates the transfer of the Arabic hierarchy into learners' IL.

Tableau 5. IL 2: Transfer of Arabic ranking into English

/klɪə(r)/	*D $_{[+center]}$	IDENT- IO	MAX-µ V	*DIPH
☞a. Kli:r		*		
b. klɪə(r)	*!			*

The result of the transferred ranking is, yet again, the adoption of a wrong system in learners' IL. In tableau (5), candidate (b), the optimal output in the target language, is ruled out due its violation of dominating *D $_{[+center]}$. There seems to be no relevant ranking between IDENT-IO and MAX-µ V, they are both crucially dominated by *D $_{[+center]}$. After enough negative evidence, learners realize that English, unlike Arabic, does in fact have centering vowels. They, then, proceed to the demotion of *D $_{[+center]}$, the constraint responsible for the absence of centering diphthongs.

Tableau 6. Demotion of *D $_{[+center]}$ below IDENT-IO

/klɪə(r)/	*D $_{[+center]}$	IDENT- IO	MAX-µ V	*DIPH
☞a. Kli:r		*		
b. klɪə(r)	*!			*

The demotion of *D $_{[+center]}$ takes place at advanced stages of acquisition i.e. the master´s level. Master´s learners' nearly perfect pronunciation of centering diphthongs confirms this claim as the difficulties once faced by SYU with regard to centering diphthongs vanished. In OT terms, master´s learners' adequate production of centering diphthongs can only be justified by the fact they have already demoted *D $_{[+center]}$ to the right end of the hierarchy.

Tableau 7. IL 3: Result of the first demotion of *D [+center]

/klɪə(r)/	IDENT- IO	*D [+center]	MAX-μ V	*DIPH
a. kli:r	*!			
☞b. klɪə(r)		*		*

The first demotion of *D [+center] below IDENT- IO optimizes the actual output in English. In tableau (9), candidate (b) is favored although it features a centering diphthong thanks to its satisfaction of higher ranked IDENT- IO. The ranking of *D [+center] above MAX-μ V, nonetheless, runs counter to our initial analysis of English diphthongs as it entails that the elimination of centering diphthongs is more important than the preservation of an underlying mora in English. The hierarchy, then, wrongly predicts that monophthongization, for example, is not fatal as MAX-μ V is ranked lower in the hierarchy. Candidates with monophthongs (e.g. [aniwɜr] (anywhere), (career) [kler] (clear)) will be considered the most optimal as they would incur only one minimal violation of MAX-μ V. To solve this problem, learners need to further demote *D [+center] below MAX-μ V. Fortunately, Moroccan EFL learners can directly proceed to the demotion of *D [+center] without any further negative evidence as it has already been established in their IL that English requires its output structures to preserve the morae in the input through the initial demotion of *DIPH below MAX-μ V. In fact, the absence of monophthongization processes at this stage of acquisition is a strong proof that the notion of weight is well established in Moroccan EFL learners' IL.

Tableau 8. IL 4: Demotion of *D [+center] below MAX-μ V

/klɪə(r)/	IDENT- IO	*D [+center]	MAX-μ V	*DIPH
a. kli:r	*!			
☞b. klɪə(r)		*		*

The result of the second demotion of *D $_{[+center]}$, as shown in tableau (8), is a hierarchy identical to the English hierarchy in that it licenses the occurrence of diphthongs on the one hand, and penalizes the deletion of underlying morae or the change in the specification of the input diphthong on the other. Like Arabic, English does not provide evidence for the ranking between IDENT-IO and MAX-μ V. However, the violation of the respective constraints is considered fatal in English. In the same vein, there is no evidence of ranking between *DIPH and *D $_{[+center]}$ as English tolerates different types of diphthongs. In the absence of further negative evidence, learners adopt the current hierarchy as it optimizes only the actual output in the target language.

Tableau 9. Result of demotion of *D $_{[+center]}$ and final state of IL

/klɪə(r)/	IDENT- IO	MAX-μ V	*D $_{[+center]}$	*DIPH
a. kli:r	*!			
☞b. klɪə(r)		*		*

In closing this section on the OT analysis of English diphthongs, one can conclude that the mismatch between the hierarchy of English and that of Arabic and French is at the origin of most errors. In fact, leaners' IL fluctuates between the hierarchy of their L2 and that of their L1. Nevertheless, with sufficient adequate exposure to the input, learners succeed to optimize the hierarchy of the target language. Optimizing diphthongs means that Moroccan EFL have avoided fossilization in this particular area.

Conclusion and recommendations

The present paper continued to explore the role of cross-linguistic influence on the acquisition of L2 phonology through the examination of the acquisition of English diphthongs among Moroccan EFL learners. The difficulties Moroccan EFL learners experience when producing English sounds are the main motivation behind undertaking the study. In fact, Moroccan EFL learners are at disadvantage as they are learning to move from a restricted phonemic inventory that admits only two diphthongs to a more elaborated inventory that admits eight. Furthermore, the CDA has been mobilized in order to account for learners' erroneous pronunciation of English diphthongs.

The analysis revealed three major trends. Firstly, the mismatch between learners' prior linguistic knowledge and English precluded the acquisition of diphthongs, a finding that has been widely attested in the L2 literature. Interestingly, both

French and Arabic served as a source of transfer at different stages of learners' IL. This finding lends further support to the TPM (Rothman, 2010, 2011) that argues for the role of all the previously learnt languages in the acquisition of any subsequent target language. Secondly, Moroccan EFL learners are sensitive to cross-linguistically marked structures as the acquisition of closing diphthongs takes precedence over the acquisition of centering ones. Errors related to centering diphthongs were eradicated only at advanced stages of acquisition. Finally, learners' academic level sets out to be a determining factor for the acquisition of English diphthongs. As stated before, Errors were progressively eradicated as learners climb the academic ladder.

The scarcity of studies on L2 phonology in the Moroccan context calls for the need of further examination of the various challenges learners face in acquiring L2 sounds. Besides, while internal factors contribute greatly to our understanding of the acquisition of foreign sounds, researchers should not overlook the impact of external factors on the process. Factors such orthography (Katz & Frost, 1992; Richlan, 2014 among others), recency (Hammarberg, 2001; De Angelis, 2007), psychotypology (Kellerman, 1983), to name but a few, in multilingual situations could explain learners' choice of the source language. Thus, Future studies should consider blending the relevant internal and external factors of L2 acquisition for a more insightful analysis of learners´ pronunciation.

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Appendix 1: The Background Questionnaire

Instructions:

This questionnaire is conducted for research purposes. Please be honest while indicating the information required below. Please put a tick (√) inside the box next to the answer of your choice. Feel free to choose one answer or more from the series of responses provided below. Your identity as well as all the information you are about to provide will remain confidential and will not be used under any circumstances for any other purposes than those of the present research project.

Very important:

1. Do not write your name
2. Please try to answer all the questions

Part I- Personal Information:

1. **Gender**: Male ☐ Female ☐
2. **Age** …
3. **Mother tongue:**
   Darija ☐ Amazigh ☐ French ☐ English ☐

Other (specify)…

4. **You are currently:**

A baccalaureate student ☐ A semester 4 student ☐ A Master's student ☐

5. **On a scale of 0 to 5, what is your mastery of the following languages:**

Darija	0	1	2	3	4	5
Amazigh	0	1	2	3	4	5
Modern Standard Arabic	0	1	2	3	4	5
French	0	1	2	3	4	5
English	0	1	2	3	4	5
Other (specify): …	0	1	2	3	4	5

Part II: context and instruction:

1. Have you ever lived in an English-speaking country?
   Yes ☐ No ☐
2. If so, how long have you been living there?
   ……
3. Have you ever lived in a French-speaking country?
   Yes ☐ No ☐
4. If so, how long have you been living there?
   ……
5. How long have you been studying English?

From primary school ☐ from middle school ☐ from high school ☐

6. Have you ever taken support classes in English?
   Yes ☐ no ☐
   If so, how many hours per week:
   ……
7. How long have you been learning English?
   2 years ☐ 4 years ☐ 6 years ☐
   8 years ☐ More than 8 years ☐ other (specify)…

Appendix 2: Multiple-choice Test

For Each sentence, decide which answer (A, B, C or D) best fits each gap:

NB: for each sentence there is only one correct answer

1. My friend was once again bullied at school because of her weight. Her classmate called her a…….
A. Cows B. Cow C. Pigs D. Friends
2. I felt very sick this morning. I was……. able to go to work.
A. rarely B. frequently C. usually D. barely
3. They were ……. to use their dictionary on the day of the exam.
A. encourage B. prevented C. Allowed D. oblige
4. Alissa is known to be very…… She has never failed an exam.
A. Bright B. mean C. Lazy D. optimistic
5. The unions now represent less ..... 10% of the French work force.
A. of B. in C. than D. then
6. She is struggling to ……. motherhood and a career as a lawyer
A. like B. afford C. Combine D. refuse
7. My grandfather is…… He will never be able to see his grandchildren.
A. deaf B. dumb C. crazy D. blind
8. Market leaders usually want to ..... their market share even further, or at least to protect their current market share.
A. decrease B. dominate C. increase D. establish
9. A lot of rich people …… the poor to get their money
A. Ignore B. Help C. Use D. Exploit
10. My taxi driver was extremely……. I almost missed my exam.
A. fast B. slow C. happy D. nice
11. If you don't like the soup, why don´t you……. the waiter to bring you another one.
A. ask B. protest C. criticize D. insult
12. A number of Moroccan youth struggle to find…….
A. Friends B. Food C. Employment D. Clothes
13. The …… now in the movie industry is to make realistic films
A. Preference B. Vogue C. Need D. Issue
14. Managers who are ambitious are ……. -oriented managers.
A. Socially B. success C. well D. non
15. He has finally decided to……. his silence and revealed the truth.

A. continue B. finish C. break D. stop

16. I did not have the chance to watch the game. I am……to know who won.

A. Happy B. satisfied C. curious D. surprised

17. Drugs eventually ……human health.

A. Help B. destroy C. enhance D. clean

18. ..... some employers oppose the very existence of unions, many theorists stress the necessity of unions.

A. Because B. due to C. however D. although

19. The ……. for AIDS has not been discovered yet

A. Cure B. drug C. help D. damages

20. Mary moved to London as she wants to pursue a modeling…….

A. Job B. career C. studies D. dream

21. We haven't had ..... news from our agent.

A. Some B. any C. no D. none

22. There is certainly a need for change, but these plans are……. and uncertain.

A. Adequate B. Crazy C. Vague D. Unknown

23. He was yelling and crying in a …….. attempt to bring his friend back.

A. Serious B. Vain C. Good D. Bad

24. You ..... fly to Dover, there isn't an airport.

A. May B. can C. may not D. cannot

25. The instruction were made……by the teacher

A. Important B. messy C. precise D. Clear

26. There was a heavy rain yesterday, we were not able to go……..

A. Nowhere B. anywhere C. elsewhere D. here

27. You won't be allowed into the club ..... you wear a suit and tie.

A. If B. unless C. whether D. apart

28. My elder sister tried to dye her …….. yesterday, the result was disastrous.

A. Nails B. hair C. face D. eyelids

29. Oh I am so ……. Let´s go and eat some pizza or something.

A. Boring B. fed up C. bored D. unhappy

30. Warning! No unauthorized personnel……. this point.

A. About B. from C. beyond D. on