An Optimality-Theoretic Account of the Acquisition of English Tenses: The Case of Moroccan EFL Learners

The study purports to describe the acquisition of the English tenses among Moroccan EFL learners. The analysis investigates each tense, employing the Constraint Demotion Algorithm (CDA). The presumption herein is that errors emerging at the initial learning states are indicators of the L1 transfer. Based on the L1 properties, CDI rearranges the constraints to establish a constraint ranking, identical to that of English, based on the hierarchy detected through Universal Grammar (UG). Two hundred and forty students, belonging to three different academic levels, participated in the study. The questionnaire they answered tested tenses through three different tasks. The output stemming from the analysis was that students' mother tongue plays an important role in the acquisition of the tenses of English. The paper also concludes that the learners reach an intermediate phase in the interlanguage before eventually learning the correct tense form.

Keywords: English tense Moroccan EFL learners, optimality theory, error-driven learning algorithm, constraint demotion algorithm

Introduction

Most language theories can be best defined as purely operational, rule-based, and/or sheer transformational. Optimality Theory (henceforth OT), however, stands out in the sense that it is rather precisely comparative. OT sprouted in theoretical linguistics as an attempt to explain cognitive linguistic understanding (Prince & Smolensky, 1993, 1996; Kager 1999; Dekkers et al 2000; McCarthy; 2000, McCarthy & Prince, 2004; Paster, 2005). The focal assertion is that Universal Grammar (UG) contains several violable constraints and “a general means for solving their conflict” (Prince & Smolensky, 1993:2). This means that for every input, the most optimal output is the most harmonic and the least violable. This in turn presupposes that an optimal candidate may perform, on some constraints ranked below the most decisive one, poorer than its competitor(s). It remains, however, the optimal option for production since it satisfies the optimal candidate requirements. For instance, “azzzzz” is alphabetized before “baaaaaa” since the alphabetical order depends on the leftmost letter. This property is referred to as the strictness of strict domination (Prince & Smolensky, 1993).

The paper at hand is organized as follows. In the first part, the paper introduces Optimality Theory as the main scaffold for research herein. It then presents the frameworks of OT used to account for the acquisitional process of English tenses in the case of Moroccan EFL learners. After reviewing the literature needed, the paper provides the methodological steps to design the study and collect the data needed for the analysis. The following part is concerned with the analysis and interpretation of the data. Lastly, the paper concludes the study with a summary of the findings.
Optimality Theory: Concepts and Conventions

Introduced in the early 1990s as an alternative model of the organization of natural human language, Optimality Theory employs candidate comparison. This process is universally shown in tableaux. In a given tableau, constraints are ordered depending on a ranking argument. The rows in the tableau contain the potential candidates, where one is the most optimal, indicated by the pointing hand. The remaining cells are dedicated to the violation marks (*). This can be demonstrated as follows:

Table 1. The Ranking Argument

<table>
<thead>
<tr>
<th></th>
<th>Constraint C1</th>
<th>Constraint C2</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. φ Candidate A</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b. Candidate B</td>
<td>** !</td>
<td></td>
</tr>
</tbody>
</table>

Candidate A above resolves the conflict of the ranking of constraint C1 above C2 and establishes a valid ranking argument. There are, however, other cases where the tableau is presented differently. For instance, when the constraints are separated with a dotted line it means that there is no ranking argument. Moreover, a constraint can be assigned more than one violation mark (*) while the existence of an exclamation mark refers to the existence of a fatal violation. There is no need to count the violation marks since the optimal candidate is identified as the one not violating the higher-ranking constraints. Hence, the notion of mark cancellation is frequently used in literature. (see Prince and Smolensky, 1993; McCarthy, 2000).

OT detaches significantly from the Sound Pattern of English model (the SPE model) (Chomsky and Halle, 1968). It is different from the previous theories as it makes the input-output relation less complicated through the use of constraints (see Kager, 1999; McCarthy, 2000). Moreover, the constraints used in OT are universal (Universality). Withdrawing from the SPE model, OT maintains the claim that there is a relationship between the input and the output. Prince & Smolensky (1993) adduced that there are two components responsible for identifying the construction of grammar in optimality theory. GEN and EVAL are two elements within the concept of Universal Grammar, as explained by Chomsky in the innateness theory. (Op. cit. 1993), however, define them as follows:

1) **GEN:** Prince and Smolensky (1993:4) “a fixed part of UG” produces a set of output candidates. They provided a schema to demonstrate how GEN functions:

   GEN. (input_k) → {output_1, output_2…output_n}

2) **EVAL:** In addition to Gen, OT makes use of the concept of Eval which evaluates the candidates generated by Gen according to the constraint hierarchy of a given language.
The function of Eval conducts an assessment to identify the well-formedness of several candidates in relation to the number of hierarchically ranked constraints in a parallel fashion. The theory of OT also makes use of several principles namely, Universality, Violability, and Ranking (see Prince and Smolensky, 1993; Heinz & Riggle, 2011). Although a lot of studies on the acquisition of the English tenses have been conducted, most of them didn’t use a constraint interaction model. For instance, Bardovi-Harlig (1992a, 1998) aimed at investigating the acquisition of the past tense form without employing OT. Conversely, several studies used the latter as well as learnability in the Moroccan context, for instance, from a morpho-syntactic point of view. (see Amrous, 2012; Zeddari, 2009). Similar to these studies, others were based on two models namely, Item and Process (I&P) and Item and Arrangement (I&A). The morphological model adopted herein is the Item and Process model (I&P). While the I&A model was adopted by studies such as Selkirk (1983) and Lieber (1992), I&P is a more viable solution for the analysis herein following the footsteps of Hockett (1954), Aronoff (1976), and Anderson (1991). Hence, only an I&P will allow the analysis of both affixes and stems. Another significant advantage of the model adopted herein resides in a study by Bat-El (2000, 2001) showing the readiness of the model to exhibit the role of morphological properties.

L2 Acquisition as Constraint Demotion

With minimal changes, the L1 transfer accounts for the acquisition of the English tenses depends heavily on the Constraint Demotion Algorithm (CDA) (Tesar and Smolensky, 1996, 1998, 2000). This algorithm adduces that UG is able to detect the dissimilarities and changes that occur between the form in the Interlanguage and the input form. The rearrangement of the constraints intends to create a correspondence between the L2 input forms and the constructed grammar. This means that the rearrangement of the constraints available to the algorithm constantly occurs until the ranking is adequate for the grammar. In other words, the process of ranking the constraints encompasses the demotion of several constraints until the appropriate hierarchy is established. Nonetheless, these constraints’ demotion does not occur haphazardly. It follows a system of consequence and succession, where every step is part of the developmental path and the L1 transfer.

In the case of L2 acquisition’s analysis, OT possesses several mechanisms that make the process different from that of the mother tongue yet equally efficient. While in L1 the entire process, including constraint ranking, is already established, L2 acquisition is confined to learning solely the rankings. That is, only the constraints’ ranking is of concern in L2 acquisition. According to Tesar and Smolensky’s model, learning is done through well-established “procedures for learning the priority ranking of constraints which….is all that distinguishes the grammar of a particular language” (Tesar and Smolensky, 1996: 5). To this end, the learning process is achieved via
several algorithms. These algorithms deal with output forms without relating them to the phonological free-variations or lexico-syntactic variations. However, alternative algorithms are used to account for the deficiency of the constraint demotion algorithm in analysing several cases such as the language alternation in certain languages.

The study makes use of CDA in that it presupposes that the errors occurring at the initial states of the learning process are manifestations of the L1 transfer. This means that L1 constraints, and their rankings, are transferred to L2. For this process to be achieved, UG plays an imperative role in detecting how the hierarchy of these constraints is different from the established ranking in L2. Hence, the algorithm aims at rearranging the constraints to establish a constraint ranking identical to that of the target language.

**Error-driven Constraint Demotion Optimization in the Acquisition Construction**

The concept of ‘grammar optimization’ or *error-driven learning algorithm* deals with the inherent capacity of grammar to be as transparent as possible (Kiparsky, 1973; Wexler and Culicover, 1980; Tesar, 1998; Giorgio, 2012a, 2012b). For grammar to achieve this transparency, the paradigms with alternations become transparent. This is due to the regularity of the alternation. On the other hand, the paradigm uniformity is established by the dominance of the faithfulness constraints (Benua 1995, 1997).

For the Error-Driven Constraint Demotion (EDCD) to allow language acquisition, only the *winner* and precise deconstruction and constraints must be the optimal result of the grammar of the target language. Constraint demotion (CD) is not employed unless the parsing of the input and the output does not match. In other words, “*each observed parse is compared with a computed parse of the input*” (Tesar and Smolensky, 2000: 30). This means that if the two parses match, learning takes place since there is no error between the input and output. Conversely, if the two parses are not identical, the error is associated with the hypothesized ranking.

CD is used to customize the hypothesized ranking. This results in an algorithm referred to as *Error-Driven Constraint Demotion*. In the latter, constraints of the winner form are demoted in the ranking to allow all, or at least one of the loser candidate’s constraints, to be dominating the optimal candidates’ constraints. The initial ranking of the constraints, however, is hypothesized after assuming that all constraints are initially equally presented. Moreover, constraint demotion is what allows the establishment of a hierarchy of constraints. The violated constraints of the optimal candidate occur below the one dominated by the least optimal candidate. Therefore, this makes the constraints violated by the optimal candidate lower ranked. To establish an initial constraints’ hierarchy, a standard treatment of markedness scales must be achieved. The claim that rises is that some constraints in UG are universally ranked in a subhierarchy.
Methodology

Research Questions

This study at hand purports to answer the following research questions:

1) How do Moroccan EFL learners acquire English tenses?
2) What is the constraints’ hierarchy resulting in the optimal candidate in the case of Moroccan EFL learners?

Research Hypotheses

In accordance with the aforementioned questions, the study recognizes two hypotheses required for the analysis to follow:

1) The UG transfer of the mother tongue properties plays a crucial role in the learning of the target language in the case of Moroccan EFL learners.
2) Moroccan EFL learners go through an intermediate phase in the interlanguage before reaching the final output product.

Research Design

This paper falls within the cross-sectional study design. The main purpose of the study is to test the question of the acquisition of English tenses in the Moroccan context from an optimality theoretic standpoint. The cross-sectional design used herein utilizes data elicited from three groups divided based on their academic level. The participants were carefully chosen to represent all the critical stages of the learning process that Moroccan EFL learners go through to acquire English tenses.

Participants

The participants in this study were 240 students, approximately an average of 60 students for each of the three different academic levels included. All participants belonged to the English department. For the Baccalaureate group, the number of participants was 40 females and 35 males. The second group were first-year college students, namely semester 2 students (S2), 40 of them were females while the number of males was 25. The third group (S6) was made of 80 college students, all of whom were in the senior year (Bachelor of Arts), 50 females and 30 males. All students participated in the study voluntarily and their identities remained anonymous. All participants were native speakers of Moroccan Arabic (MA) except for 15 participants who were native speakers of Berber (Amazigh). All the participants spoke Modern Standard Arabic (MSA) and French as second languages (L2).
Procedure

The participants filled in a background information section before completing the grammaticality judgment test. This was done so that originality and homogeneity of the sample are ensured. The participants were given enough time to complete all tasks to ensure the eliciting of genuine and representative data. After the test was distributed, the tasks were explained to the students in simplified language. This was done so it is guaranteed they fully understood what is required of them. Oversimplification of the tasks was resorted to in cases of lower academic levels when needed. The data was collected from the Faculty of Literature and Humanities in Rabat, except for the Baccalaureate group where data was collected from various High schools in the region of Rabat-Salé.

Instrumentation

The choice of the instruments was carefully considered before their selection to meet the objectives of the study. The Grammaticality Judgment Task (GJT) was used to elicit intuitive data from the participants. The translation task (TT) was employed to obtain data from the subjects through their production skills. In the same vein, a writing task (WT) was used as a final stage to assess the use of tenses in a more challenging form of production. The questionnaire as a whole consisted of five pages. The questionnaire assured anonymity of the participants. All contributors were asked to judge several randomized sentences of which, there were correct sentences intentionally included. The Translation Task (TT) was exclusively designed to provide a qualitative representation since the approach followed in this paper is that of triangulation. Finally, the writing task constituted of two paragraphs that started with instructions explaining what is required.

Results

The null hypothesis in Smith (1980), Weist et. al. (1984) claims that since the initial stages of language learning, children make use of tense morphology properly. They are also able to rightly differentiate between tense and aspect. Conversely, the alternative hypotheses presented in studies like Antinucci and Miller (1976), and Bloom et. al. (1980) claim that the early use of tense morphology by children marks aspectual differentiation. The study at hand investigates the acquisional process by which Moroccan EFL learners acquire tenses of the target language (i.e. English). The study also investigates the role of the interlanguage in the transition of the learning process from the L1 to the L2.
Simple Past

Based on the errors committed by the participants, the overarching problem that exists in their erroneous productions is overtensing. The latter refers to the fact that a verb which is presented in the syntactic structure with the past-tense lexical item (i.e. the auxiliary did) is expected to appear in the base form. However, it appears in the past tense as well, violating the Obligatory Contour Principle (OCP). (See Leben, 1973; Goldsmith, 1979; McCarthy, 1986; Odden, 1986). Some linguists have extended the notion of the OCP to syntax (see Perlmuter, 1971; Ackema, 2001). Proposed in Mohanan (1994b), a generalized version of the OCP was created to include phonology, morphology, and syntax under the name “Generalized OCP”. The latter states that Universal identical elements (melodic/formatives) are not permitted in adjacent construction that belong to the same phase. The term Spell-Out best explains the fact that within a single phase two adjacent, inflected elements, or verbs cannot occur. Since a simple syntactic construction is endowed with three spell-out domains (CP; light-v/CP Spell-Out domain, TP Spell-Out domain, and VP Spell-Out domain), only one verb in the construction is inflected. To this end, syntactic OCP that was exhibited in some of the erroneous productions by most participants infers the analysis to overtensing. Examples of the errors that present the problem of overtensing are provided in (1) as follows:

(1) **The erroneous construction**
   a. Did you did the homework?
   b. ----- you did the homework?
   **The correction construction**
   c. Did you do the homework?

In the example above, (1a) does not violate case marking. However, it seems to violate feature valuation in syntax. AGREE in the construction above is violated since the sentence values, both the auxiliary “did” and the verb “do”, violate the principle AGREE. The latter, however, requires only one ‘probe’ to be associated with only one ‘goal’. This means that the construction produced in (1a) is incorrect. It is a clear case of overtensing where both the auxiliary and the main verb are conjugated or inflected. That is, the verb ‘do’ in (1a) has undergone morphological modifications to express different grammatical categories. The construction in (1a) is a case of overtensing related to the interlanguage of the Moroccan EFL participants. This error was found in the case of adults as much as it is present in the case of younger participants. Hence, adults make over tensing errors in spontaneous speech in the process of second language acquisition (SLA) (Stemberger, 1982) though at a much lower rate than children. In the case of the participants from the

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1AGREE is a concept used by the minimalist framework to indicate the relation between certain constitutions in the syntactic tree. For example, AGREE relation must exist between the subject and the verb. This is called Subject-verb agreement.
higher academic levels, overtensing errors occurred but at a lower percentage than the participants who belonged to a lower academic level (i.e. the Baccalaureate group).

To account for the acquisition of the correct form in (1b) from the erroneous form presented in (1a), a constraint that stands out is one that has a relationship with the syntactic OCP explained earlier. Hence, the first constraint is presented below:

(2) **SinglyExpressed (Past):** (Bernhardt and Stemberger 1998) if satisfied, this constraint ensures that past tense will not be exhibited on both the auxiliary and the main verb; inflection on the auxiliary only.

In English, when both an auxiliary and the main verb are present in a clause, only the auxiliary is inflected. The presence of the auxiliary ‘*did*’ prevents marking the main verb with past tense inflectional morphology. The constraint in (2) above states that the auxiliary and the main verb cannot be inflected in the past form in the same construction. If a sentence fails to have only the auxiliary tensed, in the case of having an auxiliary with the main verb, the constraint above is then violated. Hence, the syntactic construction is ungrammatical since it violates the syntactic OCP principle.

For the second example (1b) the produced construction appears to lack the auxiliary that permits the tensing of the main verb. The construction is incomplete since the participants failed to use the auxiliary. This means that the inflection of the main verb is considered violating the English structure. In addition to violating AGREE, as explained above, this constraint fails to exhibit the auxiliary. Therefore, it fails to preserve the correct structure of English. This is an instance of violating the English structure in the production of EFL learners. Generating non-identical structures is related to the mother tongue construction. The latter syntactic structure for the (1c) is as follows:

(3) a. waʃ darti lwaʒibat djalk?
   b. ----- darti lwaʒibat djalk?

Both constructions in (3) are considered correct in MA. Using the auxiliary ‘*waʃ*’ is optional in that in both constructions the receiver of the question understands that it is addressed as such. This is based on the intonation of the speaker and the structure as a whole. This follows from the several cases of dropping several elements in the structure. The best example for deleting syntactic elements, yet preserving the same meaning, comes from the famous Pro-drop parameter in languages like Spanish and Italian. In these languages, the subject is dropped from the surface representation. A similar process exists in Moroccan Arabic (MA) in that the auxiliary is dropped and inferred from the structure. To this end, the production of some participants included dropping the auxiliary in the construction (1c). This is resulting from the transfer of the structure of their mother tongue to the construction of English. Therefore, the second constraint identified is presented below:
(4) **Expressed**<sub>verb(Past)</sub> (Bernhardt and Stemberger 1998): past tense is expressed on the main verb.

Constraint (4) above is satisfied in case the inflectional morphology is realized on the main verb only. It is not realized if the inflection is on the lexical items or morphological elements in the syntactic construction. If a sentence contains an overt auxiliary that is inflected, the sentence, in this case, the question, becomes ungrammatical.

In MA, both (3a) and (3b) are both grammatical. This means that there is a free variation nature between the two structures in the language. In English, however, the constructions in (1c) and (1b) are not of free variation. The aforementioned structure is ungrammatical given the absence of the auxiliary. This brings us to the OT tableau where both constraints are presented with the candidates established before.

**Table 2. The Past Construction**

<table>
<thead>
<tr>
<th>INPUT</th>
<th>SinglyExpressed(Past):</th>
<th>Expressed&lt;sub&gt;verb(Past)&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. waj'darti lwa'zibat djalk?</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>b. ---- darti lwa'zibat djalk?</td>
<td>*!</td>
<td>*</td>
</tr>
</tbody>
</table>

As shown above, in Moroccan Arabic, the constraints are both unmarked. Moroccan EFL learners are then influenced by their mother tongue when acquiring the structure of the target language. The unranked constraints create an issue for the Moroccan EFL learner, given the fact that there needs to be a change from the MA system. This means moving from where there is no ranking between the two constraints, to the English system where only one structure is considered grammatically correct and the two constraints are firmly ranked respectively.

It is established so far that the structure in (1c) is the correct form of English while that in (1b) is erroneous. This is explained as a result of transfer from the mother tongue. The next step is to account for the structure in (1a). The latter clearly conjugates both the auxiliary and the main verb which violates the rules of OCP in syntax and equally the constraint in (2). Because overtensing is not allowed in English, the real issue for the Moroccan EFL learner is to get rid of the variation between the two constraints. In the CDA model used in the analysis herein, the learner initiates a demotion process by which **SinglyExpressed**<sub>(Past)</sub> is demoted below **Expressed<sub>verb(Past)</sub>**. This is illustrated in the tableau below:
Table 3. The Demotion of the Past Constraints

<table>
<thead>
<tr>
<th>INPUT</th>
<th>Expressed\text{\textsubscript{verb}}(Past)</th>
<th>SinglyExpressed(Past)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Did you do your homework?</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b. Did you did your homework?</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

Demoting \textbf{SinglyExpressed (Past)} below \textbf{Expressed\text{\textsubscript{verb}}(Past)} accounts for the fact that the error of overtensing is committed in some of the productions of the participants in the process of acquiring the target language. However, the ranking is yet not established until the constraints are demoted as indicated by the arrow above Table 3. The resulted ranking is shown in Table 4.

Table 4. The Outcome of Demoting the Past Constraints

<table>
<thead>
<tr>
<th>INPUT</th>
<th>SinglyExpressed (Past)</th>
<th>Expressed\text{\textsubscript{verb}}(Past)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Did you do your homework?</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>b. Did you did your homework?</td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

The interaction between the two constraints, namely \textbf{Expressed\text{\textsubscript{verb}}(Past)} and \textbf{SinglyExpressed} (Past) have resulted into a hierarchy where one of the constraints was demoted below the other. The demotion process, based on the error-driven constraint demotion algorithm, established a hierarchy which allows the learners to learn the correct form for the past tense. To this end, the constraint hierarchy established by Moroccan EFL learners to acquire the correct past tense is linearly presented as follows:

(5) \textbf{SinglyExpressed(Past)} >> \textbf{Expressed\text{\textsubscript{verb}}(Past)}

\textbf{Simple Present}

Similar to the past tense presented in the preceding section, the analysis for the present tense is based on the errors committed by the participants. The overarching problem that seems to exist in the erroneous productions acquired by the several research instruments used herein has to do with faithfulness. The productions provided exhibited the loss of the suffix –s. In other cases, there is an addition of the aforementioned morpheme inappropriately in the simple present construction. A sample of the errors that conveyed this issue is realized below:

(6) \textbf{The erroneous construction}
   a. When someone hear….  
   b. I drinks lots of Coffee
   \textbf{The correct construction}
c. When someone hears…

d. I drink a lot of Coffee

The construction in (6a) exhibits a correct syntactic ordering of the lexical items included in the construction. However, it seems that the produced form is not entirely correct, rather it lacks the basic indicator for the simple present. As can be inferred by comparing the erroneous form (6a) with the correct form in (6c) is that the form in (6a) lacks the inflectional morpheme –s. The latter is absent in the construction of the Moroccan EFL learners. Similarly, the erroneous construction presented in (6b) shows the addition of the inflectional morpheme –s to the base ‘drink’ inappropriately. Since the pronoun does not allow the existence of the morpheme –s and the participants that committed this error added the affix, this construction is considered to be ungrammatical. This is because the correct form of the syntactic construction in (6b) is given in (6d) where the formal form of ‘lots’ is accounted for. This infers the discussion to the Correspondence Theory (McCarthy & Prince, 1995; Kager, 1999) (henceforth CT). Being an extension of classical Optimality Theory (Prince & Smolensky, 1993), the input-output correspondence is considered to be the standard instantiation of CT. This type of correspondence, being the counterpart of output-output correspondence, states that there must be a correspondence between the input and the produced output. That is, the theory relates to the underlying representation (UR) and the surface representation (SR). To achieve this correspondence, CT makes use of the concept of correspondence relation R. McCarthy and Prince explain this concept as follows:

- Given two strings $S_1$ and $S_2$, correspondence is a relation $R$ from the elements of $S_1$ and those of $S_2$. Elements $\alpha \in S_1$ and $\beta \in S_2$ are referred to as correspondents of another when $\alpha R \beta$.

(McCarthy & Prince, 1995:14)

Aside from the PARSE of the Parse/Fill model constituting faithfulness in OT as being used in Prince and Smolensky (1991, 1993), an alternative conception of faithfulness has been proposed. This is viewed as a deviation from phonological constraints that allows a more morphological analysis of the input-output relation. To this end, the constraints the analysis makes use of, to account for the two phenomena in (6a) and (6b), are as follows:

(7) Max-IO: (McCarthy and Prince, 1999) this constraint evaluates the mapping from input to output. That is, it requires that each segment in the input have a correspondent in the output.

The constraint in (10) above states that if the produced output form lacks some of the morphemes or segments of it which are patently existing in the input form, this constraint is then violated. The output form, then, is not the most optimal candidate. Correspondence between the input and output
candidates is evaluated by input-output (IO) faithfulness constraint. The erroneous constructions found in (6a) and (6b) are to be evaluated using the constraint in (7). Nonetheless, the second constraint is yet to be identified duly.

Being the opposite of what was exhibited in (6a), the erroneous production presented in (6b) shows an addition of the suffix –s to the base ‘work’. This suffix is not expected to be added in an ideal form. While the erroneous construction in (6a) witnessed the loss of the –s in the produced construction, showing a difference between the input and the output form, the construction in (7b) constitutes the opposite case. In the latter, the morphological insertion of the inflectional morpheme –s is added to the construction. Syntactically, this could be explained as an erroneous construction by virtue of the morpheme –s assumed to be realized under the functional T in the syntactic tree. The specific position of the affix is controversial since there are assumptions in minimalism that claim that the affix –s breaks the rule of having all the movement operations as being raising operations. However, the assumption, in the case of the affix, the movement is a lowering one. This is referred to in the syntactic theory as ‘Affix Hopping’. The latter assumes that the morpheme is realized in the syntactic tree, from the Underlying Representation (UR) to the surface structure, under the T position as being lowered onto a verb. This attachment is done by the “Phonetic Form component”. Nevertheless, this paper is not concerned with proving whether the suffix –s is lowered or naturally raised. Rather, it is concerned with the loss and the addition of the suffix –s erroneously based on the error-driven constraint demotion model adopted herein. To this end, the second constraint that this analysis makes use of, in addition to the constraint established in (7), to account for the two phenomena in (6a) and (6b), is as follows:

(8) **DEPFUNC**: (Grimshaw, 1997) Functional material of the output must be part of the input. If any lexical item is inserted, then this constraint is violated.

The constraint in (11) is a dependency faithfulness constraint that prohibits the insertion of functional material in the output that is not present in the input. The interaction of these two constraints is realized in Table 5.

<table>
<thead>
<tr>
<th>INPUT</th>
<th>DEPFUNC</th>
<th>Max-IO</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. When someone hears</td>
<td>*!</td>
<td></td>
</tr>
<tr>
<td>b. When someone hear</td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

The tableau above shows that the candidate b does not insert any segment. Therefore, the Max-IO constraint which requires that each segment in the input have a correspondent in the output is violated. This is because candidate b fails to keep the suffix –s in the output form although it does not add any segment to the construction. Nonetheless, the candidate does not violate the
DEPFUNC constraint since it does not insert any morphemes that are not accounted for in the input form. Whilst candidate b does not violate this constraint, candidate a, being the optimal candidate, violates it (i.e. DEPFUNC). It inserts the suffix –s to refer to the present form of the verb hear. As can be noticed, the constraints are not hierarchically ordered which can be entailed from the dotted line separating them. To this end, in the CDA model adopted in the analysis herein, the learner initiates a demotion process by which the constraint DEPFUNC is demoted below Max-IO as can be seen in Table 6.

Table 6. The Demotion Process

<table>
<thead>
<tr>
<th>INPUT</th>
<th>DEPFUNC</th>
<th>Max-IO</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. When someone hears</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b. When someone hear</td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

While Table 6 shows the direction of the demotion of the constraint DEPFUNC under the constraint Max-IO, Table 7 provides the final state of the tableau after the demotion process is established. This could be realized from the solid line separating the two constraints.

Table 7. The Resulting Hierarchy of the Constraints

<table>
<thead>
<tr>
<th>INPUT</th>
<th>Max-IO</th>
<th>DEPFUNC</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. When someone hears</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b. When someone hear</td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

Even though the hierarchy presented above seems to function for the case of not inserting the suffix –s, the constraint hierarchy is different in the case of the erroneous construction presented in (6b). The latter production is ungrammatical because the suffix –s is added to the construction where it is not meant to be. The suffix does not exist in the input form and the pronoun used in the construction is the pronoun “I”, and not “He/She or It”, that is endowed with the insertion of the suffix –s in the case of the present simple. To this end, the table below provides the constraint interaction for the erroneous construction in (6b) and its relationship with the correct form presented in (6d).

Table 8. The Present Construction for the Second Example

<table>
<thead>
<tr>
<th>INPUT</th>
<th>Max-IO</th>
<th>DEPFUNC</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. I drink a lot of Coffee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. I drinks lots of Coffee</td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

Table 8 shows the constraints and their interaction in the case of the erroneous construction presented in (6b). The tableau exhibits that the candidates ‘a’ and ‘b’ violate different constraints. Precisely, they violate the opposite of what was violated in the analysis of the erroneous construction in
(6a). Therefore, the tableau above indicates that the demotion process is done by demoting the Max-IO to realize the most optimal candidate. The latter is candidate a, being the one not violating any of the constraints above. The erroneous construction in candidate b, however, is the least harmonic since it violates DEPFUNC constraint. The latter is ranked higher than Max-IO. The final hierarchy of the constraints can be patently shown in Table 9.

**Table 9. The Resulting Hierarchy**

<table>
<thead>
<tr>
<th>INPUT</th>
<th>DEPFUNC</th>
<th>Max-IO</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. I drink a lot of Coffee</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>b. I drinks lots of Coffee</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

However, the rules of OT require the candidates to violate at least one constraint. Therefore, the third candidate adopted is as follows:

(9) **ONSET**: (Tesar and Smolensky, 1996) this constraint states that all syllables must have at an onset along with a nucleus.

The constraint in (9) states that all the constructions in the produced text must have syllables where there is, in addition to the nucleus, an onset, if not a coda. This constraint is phonological and has to do with the syllable theory. Therefore, the rankings between the constraints established before are not possible since the latter constraint is added to the analysis to satisfy the rules of OT. OT rules state that all candidates violate at least one constraint. To this end, Table 10 shows the final hierarchy after demoting the ONSET constraint from a higher stratum as being above DEPFUNC and Max-IO into a lower stratum below the two constraints.

**Table 10. Satisfying Violability**

<table>
<thead>
<tr>
<th>INPUT</th>
<th>DEPFUNC</th>
<th>Max-IO</th>
<th>ONSET</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. I drink a lot of Coffee</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>b. I drinks a lots of Coffee</td>
<td>*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

While the optimal candidate ‘a’ violates the ONSET constraint, candidate b does not. This is obvious from the use of the informal and incorrect version of the word ‘a lot’ in that in candidate a, it is realized as ‘a lot’. This, therefore, violates the ONSET constraint, while in candidate b it is realized as ‘a lots’. It should be noted that in account for the use of the informal form of ‘a lot’ the constraint of *uniformity* (McCarthy and Prince, 1995) can be made use of. The latter states that multiple input elements should not be mapped to a single output correspondent (i.e. No coalescence). However, candidate b is not considered as the optimal one since it violates a constraint that exists at a higher position in the hierarchy namely, the constraint DEPFUNC.
The ranking established for the simple present in the case of Moroccan EFL learners is of two folds based on the two productions analysed above. These permuted rankings are presented as follows:

(10) **Permuted rankings**
   a. Max-IO >> DEPFUNC
   b. DEPFUNC >> Max-IO, ONSET

The next section deals with the future simple and provides the constraints appropriately. It accounts for the errors made by the participants as a representative sample of Moroccan EFL learners.

*Future Simple*

The analysis for the past and the present constructions above included different constraints presenting both morphological and syntactic account to language. The future form, however, is expected to be different in terms of the errors committed by the participants and the constraints at play. The analysis of the future construction herein is directed towards a rigid application of X-bar principles in syntax. To analyse the erroneous constructions presented in (11) below, it is imperative to follow the assumption provided in Grimshaw (1993). The latter states that X-bar principles are assumed to be part of GEN components. Hence, only the candidates that conform to the rules of X-bar theory are analysed in OT. Grimshaw’s main contribution to this idea is the notion of an Extended Projection. This means that an IP and a CP in the syntactic tree differ from the projection of thematic heads like the VP. This gives birth to the concept of ‘trace’. The assumption in the syntactic theory is that every movement operation leaves a trace where the latter can be realized in the underlying representation. In case it does not reach the ‘spell out’ phase then this means that it does not acquire the phonetic form (PF). The erroneous constructions are presented below where the aforementioned process will be realized clearly:

(11) **The erroneous constructions**
   a. go will tomorrow morning
   b. Will go tomorrow morning
   c. I will go tomorrow morning

The erroneous form in (11a) and (11b) are both presenting a mismatch with the correct form in (11c). While (11a) satisfies the Extended Projection Principle (EPP) feature, (11b) violates it. Hence, the syntactic tree in the latter does not project into a CP. To this end, the syntactic tree lacks a very important mother constituent that makes the structure in (11b) ungrammatical. This is because all syntactic constructions are required to have a CP. The second error that exists in both construction in (11a) and (11b) is that of inversion. It is
blatantly shown in (11a)’s surface representation that inversion occurs between the two morphemes “go” and “will” respectively. Conversely, in (11b), inversion does exist equally, though it cannot be seen on the surface representation. In the case of (11b), the inversion is proved, through the aforementioned claim, on a trace where every constituent that moves to a higher position. It is universally the case despite the claim about affix hopping. Hence, the parsing process is yet to show the case of an inversion.

To analyse the two produced constructions, this study makes use of two constraints adopted from the work of Grimshaw. These constraints are displayed below:

(12) OB-HD: (Grimshaw, 1993) short for Obligatory Head. OB-HD is a constraint stating that all syntactic projection should have a head. If a syntactic projection does not project into a head, the construction is ungrammatical.

The constraint in (12) above is not to be referred to in the X-bar, rather it is part of the syntactic minimalist program. X-bar theory is assumed to be part of GEN since it generates the basics for the syntactic construction. To this end, X-bar theory is to be considered inviolable since all structures have head positions. The constraint OB-HD adopted herein is a necessary condition that put into favour structures that have the head position occupied by a certain morpheme. The satisfying requirement for this constraint is of two folds, either if the head position is filled by an input element where it is realized as a trace, or by an element that was moved from its original position into the head position. While OB-HD allows movement to fill the head position, the constraint STAY below is actually against any movement operations.

(13) STAY: (Grimshaw, 1997a:374; Legendre, Smolensky & Wilson 1998:11) this constraint claims that traces are not allowed. In other words, STAY is violated by movement as it requires all constituents to remain in their original positions.

While the other constraints are lenient and permit exceptions in OT analysis, STAY constraint in (13) does not permit any exceptions. This means that if a grammatical expression witnesses any type of movement operations, it automatically violates the aforementioned constraint. This brings the discussion into the analysis part where the erroneous constructions presented in (11a) and (11b) are accounted for respectively through the tableau bellow:
Table 11. The Inversion in the Future Simple Form

<table>
<thead>
<tr>
<th>INPUT</th>
<th>STAY</th>
<th>OB-HD</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. [CP \text{I will} [VP\text{go tomorrow morning}]]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. [CP e [TP DP \text{will} [VP\text{go tomorrow morning}]]]</td>
<td>⋄</td>
<td></td>
</tr>
<tr>
<td>c. [CP \text{go will} [TP DP e [VP t\text{go tomorrow morning}]]]</td>
<td>⋄ ⋄</td>
<td></td>
</tr>
</tbody>
</table>

Table 11 shows the interaction of the constraints with one another. It shows that candidate b and c are clearly not optimal since they incur fatal violations indicated by the question mark. Moreover, the tableau also does not provide a ranking between the constraints afforded. This is because OT is a viability theory and all candidates must violate at least one of the constraints provided. Therefore, a third constraint is added to the tableau to prove that candidate ‘a’ is truly the most optimal candidate among the three candidates provided herein. The third candidate introduced is as follows:

(14) **OP-SPEC**: (Grimshaw, 1997) this constraint states that all operators must be in specifier positions.

The constraint in (24) above attests that there must be an operator where the latter must occur in the specifier position in the syntactic tree. Another constraint that may be employed in this case is one that belongs to the family of IDENT (i.e. identity). The latter penalizes the change of features from the input to the output. Hence, the Projection Principle (see Chomsky 1981) is an input-based of the constraint PROJECTION PRINCIPLE as was presented in Schmid (1999) and Muller (2000a) equally. The latter constraint states that subcategorization features in the input must be satisfied in the output. Moreover, the subcategorization features of lexical items must be satisfied in the syntax. Nonetheless, the constraint **OP-SPEC** in (14) is more specific as Grimshaw (1997) modified the aforementioned constraints to generate the constraint in (14). The present analysis adopts the latter since it serves best the analysis in the present paper. The constraint also goes hand in hand with the nature of the mistakes committed by Moroccan EFL learners in the production represented earlier. Projection Principle, on the other hand, is more focused on the Extended Projection Principle (EPP) feature while the erroneous constructions are more oriented towards the specific position of the operator (See Chomsky, 1982; McCloskey, 1996). To this end, with the new addition the new ranking of the three constraints is presented in Table 12.
Table 12. The Final Table for the Present Construction

<table>
<thead>
<tr>
<th>INPUT</th>
<th>OP-SPEC</th>
<th>OB-HD</th>
<th>STAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. $[CP \text{ I will } [TP \text{ DP e } [vp \text{ go tomorrow morning}]]]$</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>b. $[cp e [TP \text{ DP will } [vp \text{ go tomorrow morning}]]]$</td>
<td>*!</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>c. $[CP \text{ go will } [TP \text{ DP e } [vp t_{go \text{ tomorrow morning}}]]]$</td>
<td>*!</td>
<td></td>
<td>**</td>
</tr>
</tbody>
</table>

Since pronouns are operators and the pronoun “I” exists only in the optimal candidate and since OP-SPEC requires all operators must be in specifier position, the optimal constraint is that in candidate a. Movement allows for the pronoun to be realized in the specifier position. However, for the pronoun to be realized in the operation and satisfy the OP-SPEC constraint, STAY must be violated. Thus, the pronoun is raised from the extraction site where it originates before the spell out, in the underlying representation, and moves into the specifier position. This makes it function as the operator which also explains this candidate violating STAY constraint and satisfying OP-SPEC. Since STAY is lower ranked and both OP-SPEC and OB-HD. This means that the constraints’ hierarchy, resulting in the optimal candidate, is not violated regardless of the addition of the third constraint. This leads the discussion herein into an end where all three tenses were accounted for. The hierarchy in tableau 11, in a linear form, is OP-SPEC >> OB-HD >> STAY.

Conclusion

The paper at hand succeeded in proving that Moroccan EFL learners encounter several issues in the process of acquiring English tenses. The findings conclude that the learners move from the constraint hierarchy, they already have in their mother tongue (i.e. MA), into an intermediate phase. This interlanguage phase is a hiatus stage which, eventually results in the output form after the demotion of the constraint is achieved respectively. The learning of the English language tenses was reported to be due to the transfer of the constraint ranking existing in Moroccan Arabic. These constraints are unranked (presented by the dotted line) which allows their demotion and the establishment of a new hierarchy. This new hierarchy allows the learner to acquire tenses ultimately. These findings confirm the hypotheses adopted earlier in the paper. In the same vein, the transferred constraints from MA create a perplexing issue for the learners. The differences between L1 and the target language affect the transition of the learning process. It is not until the demotion of the constraints that the learners can acquire the final correct form through the intermediate level represented by the OT analysis herein.
References


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