

L2 Morphology Acquisition Perspectives in Optimality Theory: Preliminary Observations of The Case of the Acquisition of the Past Tense Marker “-ed”

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Abstract: L2 acquisition is currently an important issue in psycholinguistics research. The conception of grammar acquisition in L2 within the optimality paradigm is different from the Universal Grammar (UG) framework. Grammar consists of a set of innate universal constraints rather than a set of rules. These constraints account for all possible child's input during the acquisition process. The function GEN (Generator) produces an infinite number of possible candidates. The learner based on his algorithm, which serves as a filter, will outrank optimal candidates in the hierarchy of constraints and demote the least optimal “the losers”. The child is able to outrank and demote candidates according to the evidence he gets from the input. The following study investigated morphology acquisition within the scope of the Optimality Theory. It aimed at examining the hypothesis of the emergence of the unmarked and the access to UG. The outcome of the study reveals that lower constraints remain in the grammar of the child and show up in cases of the emergence of the unmarked phenomena as indicated in the data recorded from my informant. Moreover, it was noticed that she still has access to the Universal Grammar (UG) since the general pattern of her utterances is characterized by a noticeable inclination towards unmarked forms rather than marked forms especially in the early stages of L2 acquisition.

Keywords: L2 acquisition, Universal Grammar, emergence of the unmarked, Optimality Theory (OT), morphology, Generator, markedness, faithfulness, constraints, ranking, input, output.

منظورات اكتساب الصرف اللغوي في نظرية الأمثلية: ملاحظات أولية حول حالة اكتساب علامة الماضي “-ed”

الدكتور / فehmi يوسف

وزارة التربية والتعليم | المغرب

المستخلص: يُعدّ اكتساب اللغة الثانية حالياً مسألة مهمة في أبحاث علم النفس اللغوي. يختلف مفهوم اكتساب قواعد اللغة الثانية، ضمن نموذج الأمثلية، عن إطار القواعد العامة تتكون القواعد العامة من مجموعة من القيود العامة الفطرية بدلاً من مجموعة قواعد. تُراعى هذه القيود جميع مدخلات الطفل المُحتملة خلال عملية الاكتساب. تُنتج دالة (المُولّد) عدداً لا نهائياً من المُرشحين المُحتملين، وسيُتفوق المُتعلّم، بناءً على خوارزميته، التي تعمل كمرشح، على المُرشحين الأمثليين في تسلسل القيود، ويُخفّض رتبة الأقل مثالية “الخاسرين”. يستطيع الطفل التفوق على المُرشحين وخفض رتبهم وفقاً للأدلة التي يحصل عليها من المدخلات. تناولت الدراسة التالية اكتساب الصرف في إطار نظرية الأمثلية. وهدفت إلى دراسة فرضية ظهور الظواهر غير المحددة والوصول إلى النحو العام. وأظهرت نتائج الدراسة استمرار وجود قيود أقل في قواعد الطفل، وتظهر في حالات ظهور الظواهر غير المحددة، كما هو موضح في البيانات المسجلة من مُخبرتي. علاوة على ذلك، لوحظ أنها لا تزال قادرة على الوصول إلى النحو العام، حيث يتميز النمط العام لألفاظها بميل ملحوظ نحو الصيغ غير المحددة على الصيغ المحددة، خاصة في المراحل المبكرة من اكتساب اللغة الثانية.

الكلمات المفتاحية: اكتساب اللغة الثانية، القواعد النحوية الشاملة، ظهور غير المحدد، نظرية الأمثلية، علم الصرف، المولد، المحدد، الإخلاص، القيود، الترتيب، المدخلات، المخرجات.

1. Introduction

L2 acquisition is currently an important issue in psycholinguistics research. Until recently linguists were interested in L2 learning from pedagogical perspectives and failed somehow to deem it as an area of research that could further help understand the cognitive processes involved in acquiring languages. There has been a growing interest, however, in the field of L2 acquisition from a psycholinguistic perspective propelled by the immense horizons it opens in grasping the inner mechanisms behind this inborn biological capacity of acquiring languages. L2 acquisition can be defined as the process through which someone acquires a second or a foreign language. Nunan (2001) defines it as “the processes through which someone acquires one or more second or foreign languages. L2 researchers look at acquisition in naturalistic contexts (where learners pick up the language informally through interacting in the language) and in classroom settings” (p.87). Researchers in L2 field investigate the acquisition of language in naturalistic contexts where learners pick up the language informally via interacting in the language with other speakers of the target language and also in classroom settings. Researchers are interested in both the output of the learners as well as in the mental process and the environmental factors that have an influence on the acquisition process.

Unlike Universal Grammar, Optimality Theory (OT) accounts for language acquisition in terms of constraints. Prince and Smolensky defended two very strong hypotheses about the universality of constraints and about the commonality of their existence in all languages. They claim that Universal Grammar (UG) contains a constraint component CON that contains the entire repertoire of constraints that are present in the grammar of all languages. The general assumption in OT is that constraint ranking is the only systematic difference between languages. Therefore, systematic differences between languages are the result of the different hierarchical classification of constraints in each language. The core idea behind OT is “that grammatical knowledge is not captured in distinct rule systems for each language, but theorists assume a universal set of constraints responsible for determining the harmony or markedness of potential realizations of some underlying input representation”. Therefore, learning a language ‘amounts to determining the correct prominence ranking over a known set of constraints to replicate the behavior observed in adult speakers’ (Kuhn, 2023, p.962).

Markedness is a linguistic concept that is used to draw a distinction in languages between basic and natural elements (unmarked) and more complex and specific ones. This concept is used as a linguistic tool to help linguists better understand the structures and forms specific to each language. The emergence of the unmarked is a term that was originally coined by Prince and Mc Carthy in 1999. It refers to situations where some marked structure is generally allowed in a language, but banned in other contexts. At the onset of acquisition, children acquiring their L1 would be more inclined to use unmarked elements than marked ones. As the child’s exposure to the motherese increases with time, marked elements that correspond to his mother tongue will overtake unmarked ones. However, the unmarked which is outranked in a particular language context may emerge again ‘the emergence of the unmarked’ in the child’s language.

Within the framework of Optimality Theory, a lot of research was conducted in the area of phonology, but there is a dearth of research in the area of morphology. The aim of this paper, therefore, is to investigate the acquisition of morphology within the scope of the Optimality Theory and to investigate the hypothesis of the emergence of the unmarked in morphology acquisition and the hypothesis of the access to UG. This study provides the first Optimality Theory analysis of past tense acquisition by Arabic-speaking children learning English, demonstrating constraint re-ranking patterns specific to this language pair.

2. Universal Grammar Theory and L1 Acquisition

Universal Grammar Theory claims that we were born with a biological disposition and innate mechanisms and parameters that render the acquisition of any human language possible. Chomsky (1980, p.38) asserts that “UG consists of a highly structured and restrictive system of principles with certain open parameters, to be fixed by experience. As these parameters are fixed, a grammar is determined what we may call a ‘core grammar’”. Within the framework of this theory, the human being is endowed with this inborn capacity that eases language acquisition. UG approaches language within a cognitive scope; a grammar can be described as the knowledge we have of our own language (“of” the language not “about” it), the speakers of their mother tongue will generate an infinite number of correct utterances without being conscious of the system of rules that underlie their formation. This knowledge allows us to produce utterances in the mother tongue and to judge whether certain sounds, words, and combinations are compatible with the grammar of our native language or not. UG is part of the innate language faculty and its role consists in determining what is or is not a possible grammar. UG provides us with a certain toolbox or LAD (Language Learning Device). It provides an inventory of possible

grammatical categories (e.g., nouns, verbs, plural, or tense as both morphological and semantic categories) in addition to an inventory of possible grammatical operations which regulates grammar functionality. Some aspects of language which are called principles of UG remain across languages; others are languages specific and vary from one language to the other according to parameters of language variation.

3. UG and Second Language Acquisition advocates

The role of Universal Grammar in first language acquisition is widely accepted by theoreticians as it accounts for the acquisition of the linguistic competence of L1 by children. However, its role in L2 acquisition continues to be a matter of controversy and debate as some researchers hold the view that UG continues to play an important role and influences the process of SLA whereas others believe that its impact lessens or that the access to it differs in the context of learning L2. There are three hypotheses about the role of UG in L2 acquisition: The first hypothesis is the 'no access hypothesis' which claims that the L2 learner has no access to UG. Advocators of this hypothesis often appeal to the Critical Period Hypothesis (CPH) developed by Lenneberg⁽¹⁾. The second hypothesis is the 'partial hypothesis' which claims that only L1- instantiated principles and parameter-values of UG are available to the L2 learner. Schachter (1989) claims that:

All that remains as part of the knowledge state of an adult native speaker of a language is a language –specific instantiation of UG, that of the first language. UG in its entirety will not be available as a knowledge source for the acquisition of a second language. Only a language –specific instantiation of it will be.....if, however, it turns out that in the acquisition of the target some instantiation of principle P is necessary and P is not incorporated into the learner's L1, the learner will have no language –internal knowledge to guide him/her in the development of P. Therefore, completeness with regard to the acquisition of the target language will not be possible (pp.13-14).

Empirical results from different studies revealed that 'L2 learners do seem to construct a grammar of the new target language under the constraints imposed by UG' (Epstein et al., 1996, p.691). The third hypothesis is 'the full access hypothesis' which claims that UG in its entirety constrains L2 acquisition. L2 learners have full access to UG not only to the instantiation forms in L1.

In L1 acquisition, learners acquire the language by use of their UG which is instantiated via exposure to the input. Thus, Learners of L2 already have an L1 which represents an instantiation of UG in that particular language and they have to go from L1 to the target language which is L2 and which has its own specific distinctive rules. An evidence of the access to the UG in L2 acquisition is the idea of interlanguage developed by Selinker (1972) who claims that learners of L2 form a kind of language that is different from the target language. Learners make errors that are systematic and that indicate the presence of certain rules as a basis behind the formation of the utterances. Another evidence is transfer that happens from L1 to L2 and which indicates that the access to UG is still possible.

4. Optimality Theory and SLA

Within the optimality paradigm, the conception of the acquisition of grammar of L2 is different from the UG framework. A grammar consists of a set of ranked constraints rather than a set of rules. These constraints define the optimal output to any input string; these constraints are supposed to be innate and universal. The function GEN produces an infinite number of possible candidate and the learner based on his algorithm, which serves as a filter, will outrank optimal candidates in the hierarchy of constraints and demote the least optimal "the losers". In other words, GEN produces a candidate set from an input and this candidate set is filtered by the Evaluator 'Eval' (as shown in Chart 1) whose job is to find the optimal candidate by applying constraint hierarchy specific to a given language. If the ranking is successful, every constraint will be put in a stratum. As Tesar and Smolensky proved, if the ranking of constraints respects the stratal hierarchy, only winning candidates will be produced by the learner.

Chart 1: /input/ → Gen → Eval → [output]

The Optimality Theory accounts for phonological acquisition within the scope of constraints rather than rules. There are two types of constraints (conflicting forces): Markedness constraints and faithfulness constraints. Markedness constraints aim at reducing the degree of markedness in output forms while faithfulness constraints aim at producing the input structure. At the onset of acquisition,

(1) He claims that the language function is lateralized to the left hemisphere of the brain and that the process of lateralization is completed by puberty. The capacity to acquire languages reduce by the time the child reaches the critical period.

markedness constraints outrank faithfulness constraints (Smolensky 1996). According to this theory, constraints that prefer loser candidates will be demoted lower in the constraints hierarchy so that in the process of winning between candidates which determines the Optimality Theory grammar, winning candidates will never lose out to rivals. As Tesar and Smolensky explained that constraints are placed in stratal hierarchy which will generate only winning candidates. According to OT assumptions, a language learner starts out with an uninformed initial constraint ranking. When he or she is exposed to an utterance by an adult speaker of the language, he or she verifies if the observed output matches his or her current ranking if not, the constraints responsible for the error are demoted in the ranking (Tesar & Smolensky, 1998).

Therefore, we can understand that errors produced by L2 learners are due to the incomplete process of constraints rankings or other factors like poor input. The lower -ranked markedness constraints don't have any visible manifestation in the output of the learner, but they are assumed to be present in the grammar. McCarthy and Prince (1994) have investigated the situation of the appearance of the low ranked constraints which they described as "the emergence of the unmarked". Optimality Theory (Prince & Smolensky, 1993) has five basic principles.

- a. **Universality.** UG provides a set Con of constraints that are universal and universally present in all grammars.
- b. **Violability.** Constraints are violable; but violation is minimal.
- c. **Ranking.** The constraints of Con are ranked on a language-particular basis; the notion of minimal violation is defined in terms of this ranking. A grammar is a ranking of the constraint set.
- d. **Inclusiveness.** The constraint hierarchy evaluates a set of candidate analyses that are admitted by very general considerations of structural well-formedness.
- e. **Parallelism.** Best-satisfaction of the constraint hierarchy is computed over the whole hierarchy and the whole candidate set. There is no serial derivation.

5. The Emergence of The Unmarked

Markedness in linguistics can be described as a concept which is used to distinguish between basic, natural, and more frequent elements (unmarked) and more complex, specific, or unusual (marked). The concept of markedness is a linguistic tool that helps in analyzing languages and in understanding how different languages organize themselves and how they opt for certain forms and structures and not others. The unmarked form is more basic and often serves as the default form whereas the marked form is more complex and often requires additional morphological markers and its use is generally restricted. The emergence of the unmarked (TETU)⁽²⁾ refers to a situation where a linguistic element, natural and basic, is used in a context which requires more complex and specific element (marked). McCarthy and Prince (1994) further explain:

An essential property of this conception of markedness is that within OT there is no parametrization in the usual sense: even in the languages where C is crucially dominated, it is not "turned off" or banished from consideration. Rather, it is fully present in the grammar, even though it is violated, under domination, in some output forms...Thus, in the language as a whole, C may be roundly violated, but in a particular domain it is obeyed exactly. In that particular domain, the structure unmarked with respect to C emerges, and the structure marked with respect to C is suppressed (p.1).

6. Results of an L2 Morphology Acquisition Study

6.1 Case Study

My informant was a 7-year-old Arabic-speaking child attending primary school. She lives in a family whose members know English and use it from time to time at home for interaction. The mother tongue is Moroccan Arabic (L1), the informant started to use

(2) TETU effects "typically follow from rankings like (1), where a markedness constraint M is dominated by a faithfulness constraint F1, which blocks M's activity in some, though crucially not all, contexts. M is free to become active in contexts where F1 isn't relevant; here, M can motivate violation of still lower-ranked faithfulness constraints (F2)". $F1 \gg M \gg F2$. Michael Becker Michael & Flack Pott Kathryn. (2011). The Emergence of the Unmarked. P.1363.

English as L2 before being exposed to French at school. She picked up the language via exposure to the internet and the family input. She is now also exposed to English at school (1hour per week). Data collection occurred over four weeks.

6.2. Experimental Task

To elicit information from my informant, I wrote on a paper the different activities that she does on a daily basis (daily routines). I wrote the sentences with verbs in the present simple. I used some pictures that represent different daily routines. I asked her to read the sentences and to tell me if I forgot anything about her daily routines. I asked her afterwards to tell me what she did yesterday and I showed her the pictures. I made sure that she understood that I wanted her to talk about yesterday not today by repeating "today is....", "yesterday was....". Then I asked her "What did you do yesterday?" I asked her this question to illicit utterances with verbs in the past simple. I repeated the question several times to get my informant talk about what she did the previous days. My experience as teacher of English helped me conduct the experiment with a certain objectivity while minimizing the bias I might bring to the study. I observed her for four weeks and repeated the task several times to make sure that she was producing the same verb forms. To further guarantee validity criteria, I made her listen to the recordings. I tried to draw her attention to the fact that some verbs in English don't take 'ed' because they have another form. I repeated several times the form of the verbs she used in her narration in their irregular form, and repeated the task several times. The results were consistent and conclusive.

6.3. Results and Analysis

I analyzed the gathered data in the recordings, and what I noticed is as follows:

She used the past tense marker "-ed" to mark regular verbs so as to talk about past events: *looked, watched, listened*.... She was also able to use and to notice the existence of the irregular verb forms like: *went-said*.... This shows that the outranking of the constraints on the stratal hierarchy is already established for her. The constraint of *the past tense marker 'ed'* is placed higher and outrank the irregular forms.

Table 1 Regular past form

Input	Candidates Max (Tense) Uniformity Faith (Root)		
/look +past/	[look]	[looked]	*[look-ed]
/watch +past/	[watch]	[watched]	*[watch-ed]
/listen +past/	[listen]	[listened]	*[listen-ed]

The past tense marker [ed] marker is correctly used to mark regular verbs. Constraints outranking is respected

Table 2 Irregular past form

Input	Candidates Max (Tense) Irregular Faith (Root)	
[go]	[went]	
[say]	[said]	
[do]	[did]	

The irregular form of irregular verbs is correctly used. Constraints outranking is respected

However, when I recorded her again in the next two weeks, I noticed that she sometimes used unmarked verbs as well to talk about the same situation. She used "go" instead of "went", "say" instead of "said", "sleep" instead of "slept", "see" instead of "saw"..... These verbs appear in utterances like:

- I go to school yesterday.
- I say to my mother.
- I sleep early yesterday.
- I go with my mummy yesterday.
- I eat an apple yesterday.
- I see a dog yesterday.

Table 3 Irregular past tense

Input	Candidates Max(Tense) Irregular Faith (Root)	
[go]	*[went]	[go]

Input	Candidates Max(Tense) Irregular Faith (Root)
[say]	* [said] [say]
[sleep]	* [slept] [sleep]
[eat]	* [ate] [eat]
[see]	* [saw] [see]

The infinitive form is used to refer to past situations resulting in the emergence of the unmarked (The default form).

She also overgeneralized the use of the “- ed” marker to mark verbs that are basically irregular in English. *buyed, , falled, slepted, eated.....* These verbs appeared in utterances like:

- I buyed a book.
- I eated my breakfast.
- I slepted early yesterday.
- I goed with my mummy yesterday.
- I writed my lessons

Table 4 Irregular verbs

Input	Candidates Max (Tense) *Irregular Faith (Root)
[buy]	* [bought] [buyed]
[eat]	* [ate] [eated]
[sleep]	* [slept] [slepted]
[go]	* [went] [goed]
[write]	* [wrote] [writed]

The overgeneralization of the use of the past tense marker [ed] marker.

Table 5 Occurrence Frequency

Session	Date	Duration	Target verbs	Correct	Errors	Error Type	Accuracy %
1	8/03/24	20min	15	12	3	Unmarked form	80 %
2	15/03/24	20min	15	11	4	overgeneralization	73%
3	21/03/24	20min	20	5	15	Unmarked form+ overgeneralization	25%
4	28/03/24	20min	20	6	14	Unmarked form +overgeneralization	30%

Statistical summary: Total verbs analyzed: 20 verbs. Overall accuracy rate: 60%. Most common errors: Overgeneralization: 20%. Default infinitive form: 20%.

After analyzing the collected data, I noticed that she continued to use the unmarked form which is the default base verb form to talk about the past. Researchers in L2 acquisition have discovered that children acquiring L2 use patterns that are independent of their native code and the target code. Broselow et al. (1998) assert that “such patterns frequently reveal a preference for less marked structures. Simplification in the direction of less marked structures is generally described as an effect of universal principles of markedness, often conceived of as part of the innate endowment provided by Universal Grammar” (p.261).

The collected data is an evidence of the emergence of the unmarked hypothesis. This hypothesis claims that lower ranked constraints remain in the grammar of the learner and might appear again in the output. This process remains until the ranking of constraints is finally established on the stratal hierarchy and the target language morphological components are fully acquired. The appearance of the unmarked verbs in their infinitive form is an indication that my informant, in OT analysis, is using the constraint “avoid inflection” which is in this case a violation of a higher constraint which is “mark infinitive” in the case of the past simple tense. Thus, the markedness constraints are outranking faithfulness constraints which results in the emergence of the unmarked (M > F). Faithfulness

constraints penalize deviations between the input (underlying form) and the output (surface form). Markedness constraints favor forms that are 'natural' or 'unmarked'. Optimality Theory, unlike traditional rule-based systems, allows constraints to be ranked and violated at the same time. The optimal form would be the one that violates the fewest constraints with regard to their ranking. Moreover, it is further evidence that my informant still has access to the Universal Grammar (UG) since the general pattern of her utterances is characterized by a noticeable inclination towards unmarked forms rather than marked forms especially in the early stages of L2 acquisition.

6.4. Study Limitations

This study is a case study and data was collected from one informant. I had the opportunity to watch and follow my informant as she was learning English as a second language rather than French (French is a second language in Morocco). I have been following her learning pattern for quite a long time and writing my remarks. The intent of this case study is not to generalize the findings and results to individuals, sites, or places outside of those under study (see Gibbs, 2007). This preliminary study was based on exploratory observations of a single participant. The study has several limitations. First, the single-participant design limits generalizability. Second, the researcher participant relationship may introduce bias. Third, the informal data collection setting may affect reliability. Future studies should employ larger samples with controlled methodologies. In fact, the value of qualitative research lies in the particular description and themes developed in context of a specific site. Particularity rather than generalizability (Greene & Caracelli, 1997).

Implications for L2 teaching

We could argue that mistakes made by L2 learners are not random but indicative of the learners' level and learning stage. They are indicative of what learners can do with the language by themselves and what they can't do without the help of their teachers. Vygotsky talks about the Zone of proximal development (ZDP) which 'represents tasks beyond the learner's current abilities but is attainable with the help and guidance of the most knowledgeable other (MKO). The ZDP is the range of tasks a person can't complete independently but can accomplish with support' (McLeod, 2024, p.2). Therefore, teachers should consider these errors as constructive and as an opportunity to scaffold the teaching so that learners can cope with the encountered difficulties. Scaffolding can be defined as 'a way to describe the support or assistance that means a student is able to do a task which they would have struggled with on their own' (Ball & Fairclough, 2025, pp.15-16). as a concept it is "based on the theory of the Zone of Proximal Development (ZDP) developed by Vygotsky, which states that with proper guidance, students can achieve a higher understanding than if they learn alone" (Sutini 2025, p.487). By scaffolding, teachers provide clues and breaks the complexities of the language into chunks that could be grasped by learners. Teachers can use different scaffolding strategies into classroom discourse, vocabulary, comprehension, , and writing across the curriculum (Blackburn, 2025). Scaffolding techniques "allow teachers to clarify the purpose and give instructionsThese techniques help learners extend their level of understanding and complete tasks successfully" (Yildiz & Celik, 2020, p.148).

7. Conclusion

To sum up, at the onset of the acquisition process markedness constraints outrank faithfulness constraints (Smolensky, 1996). Children are more inclined towards the production of the unmarked forms that are dissimilar to the adult's output. We could argue that the child constructs an interlanguage grammar in which the ranking of constraints is different from the target language code. L2 acquisition development entails the production of more marked forms that are often more faithful to the adult's output and the target code. As the child advances in a L2 acquisition via frequent exposure to the input, he or she starts promoting constraints that don't prefer any losers higher in the stratal hierarchy and demoting constraints that allow losers. However, lower constraints remain in the grammar of the child and show up in cases of the emergence of the unmarked phenomena (McCarthy & Prince, 1994) as indicated in the data recorded from my informant.

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