

Constraints and Constraint Hierarchy of Syllabification in Latin

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ABSTRACT: Optimality Theory (OT), which is the latest development of generative grammar, and is the improvement and development of classical generative phonology, defines language as a system of conflicting forces with constraint and constraint hierarchy (\mathcal{C}) as its core. OT analysis of Latin syllabification could not only help us found universality of constraints in syllabification of human languages, but also testify the universality of syllabification constraints found by previous researchers.

KEYWORDS: Latin; syllable; Optimality Theory; Constraint; Constraint Hierarchy

1. Introduction

After *Optimality Theory: Constraint Interaction in Generative Grammar*, as the fundamental work of OT, which had been written by Alan Prince and Paul Smolensky. It is not only used in phonology, but also in syntax, semantics, historical linguistics, first language acquisition, child language acquisition, foreign language learning, information processing of human brain imitated by computer and social linguistics. OT has been being vital in explaining the linguistic phenomenon, and is a universal linguistic theory (Jiang Ping 2005; Ma Qiuwu 2008).

More and more linguistics, researchers or authors try to use OT to analyze syllabification to find out the universality of syllabification constraints in human languages. In China, there are journal papers (Zhang Jisheng 2003: 7-12; Wu Hongyan 2003: 47-50; Ma Qiuwu 2004: 89-92) and monograph (Ma Qiuwu 2003). At abroad, there is *Syllable in Optimality Theory* (Fery & de Vijver 2003) and more journal papers.

Latin which has a long history is studied from different perspectives in linguistics. OT analysis of Latin syllabification could not only help us found universality of constraints in syllabification of human languages, but also testify the universality of syllabification constraints found by previous researchers. In this paper, Latin words in *A-/a-* ending in vowels, collected from *Collius Latin Dictionary and Grammar* (1970), will be as the examples

2. OT Analysis of Latin Syllabification

Latin has monophthongs, like *a, e, i, o, u, y* and diphthongs, like *ae, oe, ei, au, eu, ui* (Bennett 1895: 3) in which all monophthongs have long and short forms except *y*.

And consonants are *p, b, ph, t, d, th, c, k, q, g, ch, l, r, m, n, f, s, h, j,* and *v* (ibid: 2).

The background and development of OT (Wang Jialing 1995:1-4; Li Bing 1998:71-91), and basic framework, core idea, operational procedure of OT (Jiang Ping 2005) have been introduced by authors. Therefore, some of the constraints will be used to analyze Latin syllable are listed below:

MAX-IO

Every segment of the input has a correspondent in the output.

(No phonological deletion.)

DEP-IO

Every segment of the output has a correspondent in the input.

(Prohibits phonological epenthesis.)

IDENT-IO(F)

Output correspondent of an input [γ F] segment are also [γ F]

(Ma Qiuwu 2003:14).

NO-CODA

Syllables must not have codas.

ONSET

Syllable must have onsets.

(Kager 2001:9-10;93-94).

Next, a Latin word *admātūrō* will be analyzed by these above constraints.

Tableau 1 admātūrō

Input: / admātūrō/	IDENT-IO	MAX-IO	DEP-IO	NO-CODA	ONSET
a. ad.mā.tū.rō				*!	*
b. adm.ā.tū.rō				*!	**
c. ad.mā.tūr.ō				**!	**
d. a.dmā.tū.rō					*

e. ed.mā.tū.rō	*!			*	*
f. ha.dmā.tū.rō			*!		*!
☞g. admātūrō					*
h. a.mā.tū.rō		*!			*

In tableau 1, the input *admātūrō* has eight candidates. Constraints IDENT-IO, MAX-IO and DEP-IO are placed highly in the hierarchy for the correspondence between input and output in segment numbers and segmental features in syllabification. Candidate (e) changes the first segment from /a/ to /e/ violated IDENT-IO, and it is eliminated. (h) is out for its deletion of the second segment /d/ leading to the violation of MAX-IO. And /h/ is inserted before the first segment in (f) which is eliminated by DEP-IO.

(a), (b), (c) and (e) all have codas. So, in the column of constraint NO-CODA, (a), (b) and (e) violate for once, (c) for twice. Here, they are eliminated. And all candidates do not have onset in one or more of their syllables. Apart from the fact that (b) and (c) has two syllables without onset, the others violate constraint ONSET for once.

And the outputs, which are (d) and (g), are produced. Are they the real output? In (d), there is a complex onset /dm/ in the second syllable. It could be known that there is no such complex onset in Latin. So, a constraint,

***[dm]**: No word-initial sequence of /d/ and /m/.

is needed to eliminate (d). And in (g), it could be seen that there are four peaks in one syllable. We know that there is only one peak in one syllable. Then, a constraint

***PEAK^N**: Syllables must not have two or more than two peaks.

is needed to eliminate (g). The two newly-added constraints will be placed before NO-CODA.

Tableau 2 *admātūrō*

Input: / admātūrō/	IDENT-IO	MAX-IO	DEP-IO	*[dm]	*PEAK ^N	NO-CODA	ONSET
☞a. ad.mā.tū.rō						*	*
b. adm.ā.tū.rō						*	**!
c. ad.mā.tūr.ō						**!	**

d. a.dmā.tū.rō				*!			*
e. ed.mā.tū.rō	*!					*	*
f. ha.dmā.tū.rō			*!				*!
g. admātūrō					*!		*
h. a.mā.tū.rō		*!					*

With the help of constraint * [dm and constraint *PEAK^N, (d) and (g) are eliminated. Then, it is seen from the tableau 2 that (a) and (b) all violate NO-CODA for once. And ONSET will decide who will be the real output. Because (b) violates it for twice, it is eliminated. Now, the real output which is (a) is produce.

And we would like to use the dotted line to represent the interaction between constraints and the real line to represent domination between constraints. By this, tableau 2 will be modified as the following:

Tableau 3 admātūrō

Input: / admātūrō/	IDENT-IO	MAX-IO	DEP-IO	*[dm	*PEAK ^N	NO-CODA	ONSET
a. ad.mā.tū.rō						*	*
b. adm.ā.tū.rō						*	**!
c. ad.mā.tūr.ō						**!	**
d. a.dmā.tū.rō				*!			*
e. ed.mā.tū.rō	*!					*	*
f. ha.dmā.tū.rō			*!				*!
g. admātūrō					*!		*
h. a.mā.tū.rō		*!					*

From tableau 3, the constraint hierarchy that generates Latin word *admātūrō* is as the following:

IDENT-IO, MAX-IO, DEP-IO >> *[dm, *PEAK^N, NO-CODA >> ONSET

After the analysis of the rest of the words in *A-/a-* ending in vowels, it is known that the above constraint hierarchy could be settled. And the other constraints need to be found. The followings are those constraints¹ and their examples:

*[bd] (Abderā), *[jo] (abdicatiō), *[bf] (abfore), *[bh] (abhinc), *[je]

¹ It must be stated that all constraints are set by the author. And the phonotactics are also mentioned in previous papers or books, such as ps-, ls-, mp-, sb-, sd, sg-, pm-, tn-, gn-, pb-, pt-, lm- (p84) (Zhang Jisheng. 2000:84), *[np], *[nk], *[mk], *[pk], *[kp], *[tp], *[nf] (ibid:30), *pn-, *bn-, *tn-, *dn- (ibid:40), /nskr/ (ibid:69), [ft], [bs], [rg] (ibid:63), *lp-, *rb-, *ns-, *ms-, *rk-, *rg-, *rf-, *rth-, *rsh-, *uq- (ibid:80), *sb-, *sd-, *sg- (ibid:84), *tl-, *dl- (ibid:85), *[pw-], *[bw-], *[fw-], *[θw], *[sr-], *[hr-] (ibid:88), *-tr, *-dr, *-km (ibid:93), *[tʃju:] (ibid:98), *[-kpt], *[pt], *[bd] (ibid:136), *kt-, *ft- (ibid:137), ls-, rp-, wk- (ibid:147) *ks-, *tp-, *sθ, *mn-, *lr (ibid:154) and so on.

(abiectum), *gn] (abiēgnus), *eo:] (abeō), *ju:] (abiūdicō), *nkt] (abiūnctus), *nk] (abiūnctus), *ng] (abiungō), *nx] (abiūnxī), *bl] (ablātus), *ue] (abluere), *bn] (abnegō), *pt] (abneptis), uo:] (abnuō), *eo:] (ablōleō), *jo] (abortiō), *rt] (abortivus), *br] (abrādō), *mp] (abrumpō), *bsk](abscīdō), *nd] (abscindō), *nt] (absentia), *bs] (absiliō), *ju] (absinthium), *nth] (absinthium), *th] (absinthium), *st] (absistō), *lv] (absolvō), *rb] (absorbeō), *rg] (abstergeō), *rd] (absurdē), *rn] (Acarnānes), *ns] (accēnseō), *rs] (accersō), *lt] (accultum), *mb] (accumbō), *rv] (acervus), *aeu] (Achaeus), *āia] (Achāia), *ōiu] (Achelōius), *kw] (aquiēscō), *oa:] (ācroāma), *ua:] (āctuāria), *uo:] (āctūōsē), *ea:] (aculeātus), *e:u] (adamantēus), *sd] (adesdum), *df] (adfābilis), *ld] (adlātum), *rm] (adfirmāte), *df] (adfleō), *ue:] (adfluēns), *ue] (adfluentia), *uō] (adfluō), *uī] (adfuī), *lg] (adfulgeō), *dg] (adgemō), *dh] (adhaereō), *mpt] (ademptum), *dl] (adlābor), *ps] (adlāpsus), *i:o:] (admiratīō), *xt] (admixtiō)

And it could be seen that the above constraints which are concerned with complex coda might be substituted by the following constraint,

***COMPLEX^{COD}**

Codas are simple

(Kager 2001:97)

Meanwhile, there are complex onsets in Latin, like *kr-* in *Acragās*. And those on long vowel and long vowel, short vowel and long, and triphthong could be expressed in the following way:

***VVV]σ**

No triphthong.

***V_LV_L]σ**

No tautosyllabic sequence of long vowel and long vowel.

***VsV_L]σ**

No tautosyllabic sequence of short vowels and long vowel

*VLVs] σ

No long vowel before tautosyllabic short vowel.

(Li Bin 2010: 27)

The above constraints would be placed after NO-CODA. And *PEAK/C (Hammond 1997:5) is added after *PEAK^N to prevent those candidates having a consonant as a syllable peak. Then, the constraint hierarchy of Latin words in A-/a- ending in vowels is in the following:

IDENT-IO, MAX-IO, DEP-IO >> *PEAK^N, *PEAK/C, *VVV] σ , *VLVL] σ , *VsVL] σ , *COMPLEX^{COD}, NO-CODA >> ONSET

And the specific constraints are *bd], *jo], *bf], *bh], *je], *gn], *eo:], *ju:], *nkt], *nk], *ng], *nx], *bl], *ue], *bn], *pt], *uo:], *eo:] , *jo], *rt], *br], *mp], *bsk], *nd], *nt] (absentia), *bs], *ju], *nth], *th], *st], *lv], *rb] , *rg], *rd], *rn], *ns], *rs], *lt], *mb], *rv], *aeu], *āia], *ōiu], *kw], *oa:], *ua:], *uo:], *ea:], *e:u], *sd], *df], *ld], *rm], *dfl], *ue:], *ue], *uō], *uī], *lg], *dg], *dh], *mpt], *dl], *ps], *i:o:] and *xt].

3. Conclusion

Herein, Latin words in A-/a- ending in vowels are analyzed from the perspective of OT. And we found the constraint hierarchy and constraints in syllabification.

Constraints and Constraint Hierarchy of Syllabification in Latin is my interest. And I would like to find constraints and constraint hierarchy of syllabification in Latin. But, the Latin words analyzed are limited in the paper. I still need to further this research with more data. This is what I plan to do in the next step.

And, there might be some mistakes or errors that I could not find out. Any suggestions or comments on this research are welcomed.

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