

Chapter 4: Full-form grammar and transparadigmatic homophony creation

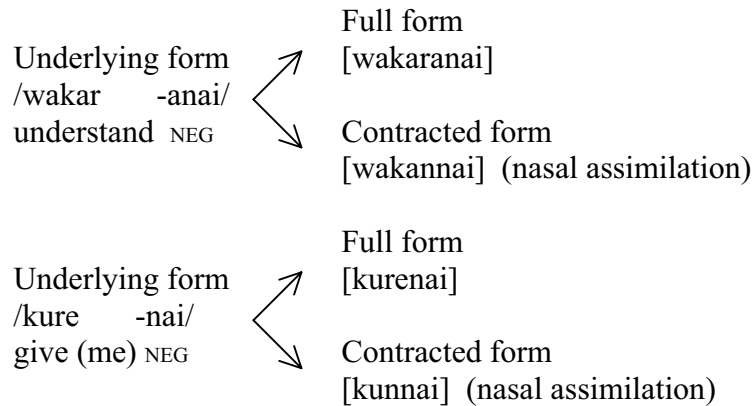
4.1. Introduction

In Chapter 3, the contraction grammar and its layout has been established. In this chapter, I will introduce the full-form grammar from which an underlying form surfaces without contraction. There are cases where transparadigmatic homophony in inflectional morphology is created without blocking, for example, *katta* (< kar-ta ‘clip, PAST’) and *katta* (< kaw-ta ‘buy, PAST’). Such cases challenge the anti-homophony blocking principle presented in this dissertation as they could be counterevidence of anti-homophony blocking in full-form grammar and in some cases in the contraction grammar. I will examine each such case of transparadigmatic homophony creation. From there, I will argue that homophony is allowed despite the existence of anti-homophony constraint CONTRAST in order to respect the constraints ranked higher than CONTRAST. It will be argued that anti-homophony principle must be an outrankable and violable constraint embedded in the phonological grammar. The relationship between the contraction and full-form grammars will also be discussed. I will demonstrate that the two grammars share the same constraints and the ranking except for the position of the faithfulness constraint MAX-V. The relativized MAX-V results in different surface forms of the two grammars.

4.2 Full-form grammar

In this section, I will discuss the ranking of the constraints in the full-form grammar and the relation of the full-form grammar to the contraction grammar. In section 2.2, I discussed the coexistence of two forms, full-form and contraction form in (23), repeated here as (131), was discussed.

(131) Coexistence of two forms



In the preceding chapter, I demonstrated that certain constraints and ranking specific to the contraction grammar in (128), repeated below, successfully account for the contracted forms in Japanese.

(132) Ranking of main constraints in the contraction grammar SYLLSTRUC >> INITIAL-C, CONTRAST >> FINAL-C >> MAX-V

I will argue in the discussion below that in the full-form grammar, the vowel-faithfulness constraint MAX-V is ranked higher than the constraints which drive syncope, namely INITIAL-C and FINAL-C. These two grammars are minimally different, “minimally” meaning that the position of the faithfulness constraint MAX-V relative to the other constraints. I will demonstrate how the ranking of the constraints in the full-form grammar accounts for the nonoccurrence of nasal assimilation.


Nasal assimilation does not occur in the full-form grammar.

- (133) No nasal assimilation in the full-form grammar (a consonant-final verb)
 wakar **-anai** → wakar**anai**
 understand NEG

The tableau below shows that MAX-V must also outrank INITIAL-C since syncope does not occur.

Tableau 62


Full-form grammar: Nonoccurrence of nasal assimilation of a consonant-final verb
 MAX-V >> INITIAL-C

/wakar-anai/	MAX-V	INITIAL-C
a.  wakar anai		*
b. wak annai	*!	

We know already that SYLLSTRUC is also ranked higher than INITIAL-C. The tableau below relays the full analysis. The ranking between SYLLSTRUC and MAX-V is not motivated.

Tableau 63

Full-form grammar: Nonoccurrence of nasal assimilation of a consonant-final verb
 SYLLSTRUC, MAX-V >> INITIAL-C

/wakar-anai/	SYLLSTRUC	MAX-V	INITIAL-C
a.  wakar anai			*
b. wak arnai	*!	*	
c. wak annai		*!	
d. wak arra i	*!	*	

Candidates b) and d) are excluded because of the violation of SYLLSTRUC. Candidate c) makes a fatal violation of MAX-V which outranks INITIAL-C. Candidate a) violates INITIAL-C but it is still selected as optimal. Thus, the ranking SYLLSTRUC, MAX-V >> INITIAL-C is motivated, and nasal assimilation of a vowel-final verb does not occur.

- (134) Nonoccurrence of nasal assimilation in the full-form grammar (a vowel-final verb)

kure -nai → kurenai
 give (me) NEG

This nonoccurrence of nasal assimilation can be similarly accounted for by using FINAL-C. First, MAX-V outranks FINAL-C.

Tableau 64

Full-form grammar: Nonoccurrence of nasal assimilation of a vowel-final verb
 MAX-V >> FINAL-C

	/kure-nai/	MAX-V	FINAL-C
a.	kurenai		*
b.	kunnai	*!	

We know that SYLLSTRUC is ranked higher than FINAL-C. The tableau below shows the full analysis.

Tableau 65

Full-form grammar: Nonoccurrence of nasal assimilation of a vowel-final verb
 SYLLSTRUC, MAX-V >> FINAL-C

	/kure-nai/	SYLLSTRUC	MAX-V	FINAL-C
a.	kurenai			*
b.	kurnai	*!	*	
c.	kunnai		*!	
d.	kurrai	*!	*	

Ranking SYLLSTRUC, MAX-V >> FINAL-C crucially selects a) *kurenai* as optimal. So far, I have argued that in the full-form grammar, SYLLSTRUC and MAX-V are ranked higher than INITIAL-C and FINAL-C

- (135) Full-form grammar
 SYLLSTRUC, MAX-V >> INITIAL-C, FINAL-C

The ranking between INITIAL-C and FINAL-C is not motivated.

So far, I have not discussed whether CONTRAST exists in the full-form grammar in addition to the contraction grammar. If anti-homophony blocking principle is incorporated into the grammar as the anti-homophony constraint CONTRAST, this constraint must also exist somewhere in the full-form grammar. I base this assumption of the existence of CONTRAST in the full-form grammar on the hypothesis in Optimality Theory that a set of constraints is the same in every human language and the ranking of the constraints is unique to each individual language. Then, where is CONTRAST ranked in the full-form grammar? In full-form grammar, nasal assimilation does not occur to either member of the pair.


(136) No nasal assimilation in the full-form grammar

wakar -anai → wakar**an**ai
 understand _{NEG}
 wakare -nai → wakare**n**ai
 get separated _{NEG}

The tableau below (the full-form grammar version of the nasal assimilation in tableau 51 excluding INITIAL-C and FINAL-C) shows that MAX-V is violated by all candidate sets except for the most faithful candidate set a). The ranking of CONTRAST cannot be motivated because CONTRAST can be ranked lower or higher than MAX-V. At this point, we cannot provide evidence for the ranking of CONTRAST.

Tableau 66

MPA in the full-form grammar: Nonoccurrence of nasal assimilation

	/wakar-anai : wakare-nai/	MAX-V	CONTRAST
a. 	wakar an ai : wakare n ai		
b.	wak ann ai : wakare n ai	*!:	
c.	wakar an ai : wak ann ai	:*!	
d.	wak ann ai : wak ann ai	*!:*	*

The ranking of CONTRAST is established in the analysis of the following pair. Recall in (116), repeated below that homophony is blocked in the pair *kar-inasai* ‘clip, POL-IMP’ and *kari-nasai* ‘borrow, POL-IMP’.

- (137) Contraction grammar
 kar -inasai → kannasai
 clip POL-IMP
 kari -nasai → *kannasai
 borrow POL-IMP

In the full-form grammar on the other hand, homophony is created.

- (138) Full-form grammar
 kar -inasai → karinasai
 clip POL-IMP
 kari -nasai → karinasai⁴⁵
 borrow POL-IMP
- } homophony

As shown in the “contrastiveness” evaluation in table 7 in 3.5, MAX, DEP as well as ANCHORING are violated in /kar-inasai/ → /kari-nasai/, so these two inputs are contrastive. Thus, this pair is qualified for an evaluation using CONTRAST. The tableau in the full-form grammar below shows that CONTRAST must be ranked lower than MAX-V.

Tableau 67

MPA: /kar-inasai/ vs. /kari-nasai/ in the *full-form* grammar

MAX-V >> CONTRAST

/kar-inasai : kari-nasai/	MAX-V	CONTRAST
a. ✖ karinasai : karinasai		*
b. kannasai : karinasai	*!:	
c. karinasai : kannasai	:*!	
d. kannasai : kannasai	*!.*	*

⁴⁵Similarly, the affixation of the desiderative /-tai/ creates homophony.

- (i) kar-itai → karitai
 clip, DESI
 kari-tai → karitai
 borrow, DESI

However, there is no ranking motivation among CONTRAST, INITIAL-C and FINAL-C.

Tableau 68

MPA: /kar-inasai/ vs. /kari-nasai/ in the full-form grammar

MAX-V >> INITIAL-C, CONTRAST, FINAL-C

/kar-inasai : kari-nasai/	MAX-V	INITIAL-C	CONTRAST	FINAL-C
a. $\text{karinasai} : \text{karinasai}$		*:	*	:*
b. $\text{kannasai} : \text{karinasai}$	*!:			:*
c. $\text{karinasai} : \text{kannasai}$:*!	*:		
d. $\text{kannasai} : \text{kannasai}$	*!:*		*	

Thus, the total ranking so far is as follows:

(139) Full-form grammar

SYLLSTRUC, MAX-V >> INITIAL-C, CONTRAST, FINAL-C

Tableau 69

MPA in the full-form grammar: Nonoccurrence of nasal assimilation

MAX-V >> INITIAL-C, FINAL-C

/wakar-anai : wakare-nai/	SYLLS TRUC	MAX-V	INITIAL -C	CONTRAST	FINAL- C
a. $\text{wakaranai} : \text{wakarenai}$			*:		:*
b. $\text{wakannai} : \text{wakarenai}$		*!:			:*
c. $\text{wakaranai} : \text{wakannai}$:*!	*:		
d. $\text{wakannai} : \text{wakannai}$		*!:*		*	

4.3 Transparadigmatic homophony creation

In the previous section, I have assumed that the anti-homophony constraint CONTRAST exists even in the full-form grammar, and demonstrated its ranking among other constraints. In this section, I will review three patterns of homophony creation in the full-form grammar and account for these cases, which are possible counterevidence of anti-homophony principle. The three patterns are: 1) neither members of a pair undergo a

phonological process resulting in homophony (“neutralization without alternation”), 2) both members of a pair undergo a phonological process resulting in homophony (“neutralization of two-way alternation”), 3) only one member of a pair undergoes a phonological process resulting in homophony with the other monophonemic member (“neutralization of one-way alternation”). I will demonstrate that in all the patterns, homophony is created in inflectional morphology despite CONTRAST in the full-form grammar due to a fatal violation of SYLLSTRUC and MAX-V which are ranked higher than CONTRAST. Homophony is sometimes created even in the contraction grammar when there is a fatal violation of constraints ranked higher than CONTRAST. In short, the anti-homophony effect only emerges when there is no violation of the constraints ranked higher than CONTRAST.

4.3.1 Homophony pattern 1: Neutralization without alternation and “Emergence of the Unmarked”

To my knowledge, there is no research to this date that has presented the argument that the anti-homophony principle is applicable in transparadigmatic relations in addition to paradigmatic relations. As reviewed in section 1.2.4, Itô and Mester (2004b) propose that the anti-homophony constraint ParadigmaticContrast (PARCONTRAST) assigns one mark for each pair of paradigm members that are not phonologically distinct. They claim that this constraint only applies within the paradigm of a single lexical item, not applicable across paradigms. If the anti-homophony constraint is transparadigmatic, how are the many cases of homophony across paradigms explained?

In order to address this question, we will take a look at /kar-inasai/ and /kari-nasai/ pair one more time. This is the first of three patterns of homophony creation where neither members of a pair undergo a phonological process resulting in homophony, which I call “neutralization without alternation.” No contraction occurs and homophony is allowed in the full-form grammar in (138), repeated below as (140), but homophony creation is blocked when the contraction grammar is applied in (137), repeated below as (141).

(140) Full-form grammar
kar -inasai → karinasai
clip POL-IMP
kari -nasai → karinasai
borrow POL-IMP

} homophony

(141) Contraction grammar
kar -inasai → kannasai
clip POL-IMP
kari -nasai → *kannasai, karinasai
borrow POL-IMP

The question is: how do the two grammars differ in such way that homophony creation is allowed in one grammar and it is blocked in another? As shown in tableau 68, repeated below as tableau 70, homophony is created in the full-form grammar due to the fatal violation of all the candidates, except for the homophonous candidate a), of MAX-V, which is ranked higher than CONTRAST.

Tableau 70

MPA: /kar-inasai/ vs. /kari-nasai/ in the *full-form* grammar
 MAX-V >> INITIAL-C, CONTRAST, FINAL-C

/kar-inasai : kari-nasai/	MAX-V	INITIAL-C	CONTRAST	FINAL-C
a. \Rightarrow karinasai : karinasai		*:	*	:*
b. kannasai : karinasai	*!:			:*
c. karinasai : kannasai	:*!	*:		
d. kannasai : kannasai	*!:		*	

In the contraction grammar on the other hand, as we saw in tableau 53, repeated below as tableau 71, CONTRAST exerts its force in disqualifying homophonous output d) because there is no violation of the candidate ranked higher than CONTRAST, namely SYLLSTRUC.

Tableau 71

MPA: /kar-inasai/ vs. /kari-nasai/: nasal assimilation in the *contraction* grammar

/kar-inasai : kari-nasai/	SYLLSTRUC	INITIAL-C	CONTRAST	FINAL-C	MAX-V
a. karinasai : karinasai		*!:	*	:*	
b. \Rightarrow kannasai : karinasai				:*	*:
c. karinasai : kannasai		*!:			:*
d. kannasai : kannasai			*!		*:*

Thus, the homophony is blocked. In tableau 70, homophony is allowed and the anti-homophony effect is not in sight because of violations of MAX-V which is ranked higher than CONTRAST. The situation is the same in tableau 51, repeated below (SYLLSTRUC is added to the tableau).

Tableau 72

MPA: /wakar-anai/ vs. /wakare-nai/: nasal assimilation in the *contraction* grammar

/wakar-anai : wakare-nai/	SYLLSTRUC	INITIAL-C	CONTRAST	FINAL-C	MAX-V
a. wakaranai : wakarenai		*!:		:*	
b. \Rightarrow wakannai : wakarenai				:*	*:
c. wakaranai : wakannai		*!:			:*
d. wakannai : wakannai			*!		*:*

Anti-homophony blocking only emerges when there is no violation of the constraints ranked higher than the anti-homophony constraint CONTRAST. The case of anti-homophony blocking in the contraction grammar is due to an emergence of CONTRAST. This is an example of “Emergence of the Unmarked” (McCarthy and Prince 1994), a circumstance in which a constraint, typically “unmarked” or “dormant” due to dominating constraint(s), unexpectedly surfaces since phonotactics does not block contraction independently and MAX-V is not ranked higher to prevent blocking of syncope. Thus, CONTRAST takes control.

4.3.2 Homophony pattern 2: Neutralization by two-way alternation

In this section, I will introduce the second pattern of homophony creation despite a violation of CONTRAST., namely a transparadigmatic homophony creation in both full-form and contraction grammars in the affixation of the past morpheme /ta/ and the gerund /te/.

A historical morphophonemic sound change called *onbin* (sound euphony) began in the Heian period (A.D. 794-1192). *Onbin* is still observed in contemporary Japanese. *Soku-onbin* (or moraic obstruent), one of the *onbin* phenomena, is illustrated below:

$$(142) \quad \overline{\text{soku-onbin}} \\ \left. \begin{array}{l} \text{CVt} \\ \text{CVr} \\ \text{CVw} \end{array} \right\} -\text{ta} \rightarrow \text{CVtta}$$

There is a case in which homophony is created as a result of gemination of different verb root-final consonants.

- (143) /kaC/ + PAST (C: /t/, /w/, /r/)
- a. kát -ta → kátta
 win PAST
 káw -ta → kátta
 keep an animal PAST
- b. kaw -ta → katta
 buy PAST
 kar -ta → katta⁴⁶
 clip PAST

In the examples above, accentuation is described in order to show that a) and b) are different in accent: *kát* and *káw* are lexically accented and *kaw* and *kar* are unaccented. *Soku-onbin* was caused by a historical loss of /i/ in the past morpheme /ita/. See Appendix C for history and patterns of *onbin*. The same homophony pattern by *soku-onbin* is observed in the suffixation of the gerund /te/ due to a loss of /i/ in /ite/.

- (144) /kaC/ + gerund /te/ (C: /t/, /w/, /r/)
- a. kát -te → kátte
 win GER
 káw -te → kátte
 keep an animal GER
- b. kaw -te → katte
 buy GER
 kar -te → katte
 clip GER

In *soku-onbin*, due to a violation of one of the canonical constraints in SYLLSTRUC, either CODACOND (*CVr.ta.), NOCOMPLEXONSET (*CV.rta.) or NOCOMPLEXCODA (*CVrt.a.), as

⁴⁶For past formation, a polite expression exists in addition to nonpolite.

- (i) a. kaw -imasita → kaimasita
 buy PAST (polite)
 kaw -ta → katta
 buy PAST (nonpolite)
- b. kar -imasita → karimasita
 clip PAST (polite)
 kar -ta → katta
 clip PAST (nonpolite)

The polite past formations in a) and b) do not create homophony. The polite and nonpolite past formation have different underlying forms.

pointed out by Itô and Mester (1999), the root-final codas, *r* and *w*, assimilate to the suffix-initial *t*. I will analyze *soku-onbin kar-ta* ‘clip, PAST’ → *katta* first. Neither the most faithful candidate *karta* nor assimilation of *t* to *r*, *karra*, appears. These forms violate SYLLSTRUC. On the other hand, changing *r* to *t*, violates MAX [son] as we saw in tableau 29. This indicates that SYLLSTRUC must be ranked higher than MAX [son].

Tableau 73

Soku-onbin of /kar-ta/ ‘clip, PAST’:

SYLLSTRUC >> MAX [son]

/kar-ta/	SYLLSTRUC	MAX [son]
a. $\text{[k]}\text{[a]}\text{[t]}\text{[a]}$ katta		*
b. karta	*!	
c. karra	*!	

Since there is no syncope in this evaluation due to the fact that the past morpheme is underlyingly /ta/, not /ita/, MAX-V is excluded in this tableau. This tableau shows that SYLLSTRUC is ranked higher than MAX [son]. Recall in section 3.4, especially in tableau 29, the ranking between SYLLSTRUC and MAX [son] was not motivated but here we have evidence for the following ranking.

(145) SYLLSTRUC >> MAX [son]

A consonant deletion at the morpheme boundary does not occur. Since INITIAL-C and FINAL-C are ranked lower than MAX [son], motivated in tableau 26, MAX-C must be ranked higher than INITIAL-C and FINAL-C in order for neither *kara* nor *kata* to be surfaced.

(146) MAX-C: Do not delete a consonant

Tableau 74

Soku-onbin of /kar-ta/ ‘clip, PAST’:
MAX-C >> INITIAL-C >> FINAL-C

/kar-ta/	MAX [son]	MAX-C	INITIAL-C	FINAL-C
a. 𑖅 katta	*			
b. kara		*	*!	
c. kata		*		*!

The ranking between MAX [son] and MAX-C is not motivated. In nasal assimilation, *r* assimilates to *n*. Why, then, does *r* not change to *n* in this case: *kar-ta* → **kanta*? In the Yamato (original Japanese) vocabulary, there are no consonant clusters such as **nt*, **mp*, **ŋk*. This constraint is called POSTNASVOI (Itô and Mester 1995b). This constraint is violable by the strata other than Yamato.⁴⁷

(147) POSTNASVOI: Post-nasal obstruents must be voiced.

This constraint must be ranked higher than MAX [son].

Tableau 75

Soku-onbin of /kar-ta/: POSTNASVOI >> MAX [son]

/kar-ta/	POSTNASVOI	MAX [son]
a. 𑖅 katta		*
b. kanta	*!	

Voicing after a nasal is not realized in this case: *kar-ta* → **kanda*. This indicates that DEPLINK [voice] must be ranked higher than MAX [son] because /t/ gains nasality. *kar-ta* → **kanna* is also accounted for by DEPLINK [voice].

⁴⁷Itô and Mester (1995a) claim that the Japanese vocabulary has several strata: Yamato (original Japanese), Sino-Japanese (Loan words of Chinese origin), Foreign, Mimetic, and the acceptability of constraints on well-formedness by each stratum varies (Itô and Mester 1995b further specify the foreign stratum into assimilated foreign called “Foreign” and unassimilated foreign called “Alien”). In their theory of the Core-Periphery structure, Japanese vocabulary has stratum-specific phonological phenomena. Yamato is the most constrained stratum as the core of the Japanese vocabulary, the violation of a set of constraints increases as “foreignness” of stratum increases (more toward the periphery) (See Itô and Mester 1995b for further details).

- (148) DEPLINK [voice]: Do not add a [voice] feature to a segment that it did not have underlyingly

Tableau 76

Soku-onbin of /kar-ta/: DEPLINK [voice] >> MAX [son]

/kar-ta/	DEPLINK [voice]	MAX [son]
a. ㄎ katta		*
b. kanda	*!	
c. kanna	*!	

At this point, we do not know the exact ranking of MAX-C relative to SYLLSTRUC, POSTNASVOI and DEPLINK [voice] but in the full tableau 77, I chose the ranking is SYLLSTRUC, POSTNASVOI, DEPLINK [voice] >> MAX-C. The exact ranking MAX-C is not important because the ranking of MAX-C would not change the winner as long as it is ranked higher than INITIAL-C and FINAL-C.

Tableau 77

Soku-onbin of /kar-ta/: Full analysis

/kar-ta/	SYLLS TRUC	POSTNA sVOI	DEPLINK [voice]	MAX [son]	MAX-C	INITIAL- C	FINAL- C
a. karta	*!						
b. ㄎ katta				*			
c. karra	*!		*				
d. kara					*	*!	
e. kata					*		*!
f. kanta		*!					
g. kanda			*!				
h. kanna			*!				

Recall that in (128) and (139), the main difference between the contraction grammar and the full-form grammar is the position of MAX-V.

- (149) Contraction grammar

SYLLSTRUC >> INITIAL-C, CONTRAST >> FINAL-C >> MAX-V

Full-form grammar


SYLLSTRUC, MAX-V >> INITIAL-C, CONTRAST, FINAL-C

Note that the faithfulness constraint MAX-V would not be violated by any of the candidates in tableau 77 (and thus, this constraint is not included in this tableau). The ranking between INITIAL-C and FINAL-C does not contribute to the determination of the winner, either it is INITIAL-C >> FINAL-C or INITIAL-C, FINAL-C. This means that tableau 77 would represent *soku-onbin* of /kar-ta/ in the contraction grammar in addition to the full-form grammar by simply unranking INITIAL-C and FINAL-C. Regardless of the grammar, *soku-onbin* of /kar-ta/ occurs.

The analysis of *soku-onbin* of /kaw-ta/ ‘buy, PAST’ are the same as the analysis of *soku-onbin* of /kar-ta/ ‘clip, PAST’.

Tableau 78

Soku-onbin of /kaw-ta/ ‘buy, PAST’: Full analysis

/kaw-ta/	SYLLS TRUC	POSTN ASVOI	DEPLINK [voice]	MAX [son]	MAX-C	INITIAL- C	FINAL- C
a. kawta	*!						
b.  katta				*			
c. kawwa	*!		*				
d. kawa					*	*!	
e. kata					*		*!
f. kanta		*!					
g. kanda			*!				
h. kanna			*!				

Now we are able to account for *soku-onbin* of /kar-ta/ and /kaw-ta/.⁴⁸

⁴⁸As shown in (188) in Appendix C, verbs ending with a voiced obstruent or a nasal triggers *hatsu-onbin*, another type of *onbin*, in which these consonants become *n* along with voicing of *t* to *d*: *tob-ta* ‘fly, PAST’ → *tonda*, *yom-ta* ‘read, PAST’ → *yonda*, and *sin-ta* ‘die, PAST’ → *sinda*. By posing 1) MAX [voice] Obstruent, which prohibits the deletion of the voicing of an obstruent (Lombardi 1991), and 2) MAX [nas], which prohibits the deletion of a nasal, and ranking them, higher than DEPLINK [voice], *hatsu-onbin* can be accounted for, as below.

Now we move on to the analysis of /kar-ta/ and /kaw-ta/ in MPA in the full-form and contraction grammars. The four combinations of candidates a) and b) in tableaux 77 and 78 are used in tableau 79 below. The ranking between MAX [son] and CONTRAST is not motivated, so at this point, these two constraints are unranked. Since this tableau does not show MAX-V, INITIAL-C or FINAL-C in the tableau, it represents both grammars.

Tableau 79MPA: *Soku-onbin* in both grammars

	/kaw-ta : kar-ta/	SYLLSTRUC	MAX [son]	CONTRAST
a.	kawta : karta	*!:*		
b.	katta : karta	:*!	*:	
c.	kawta : katta	*!:	:*	
d.	𑂔𑂗𑂢𑂰 katta : katta		*:*	*

Candidates a)-c) all violate SYLLSTRUC. Although candidate d) violates CONTRAST, it still wins out. This tableau clearly indicates that the homophony *katta/katta* is created despite the violation of CONTRAST, due to the fact that all other candidates fatally violate SYLLSTRUC, which is ranked higher than CONTRAST. Thus, the effect of CONTRAST does not emerge and the homophony is allowed.

Soku-onbin is an obligatory process at the price of homophony. In the affixation of the past suffix /ta/ and the gerund /te/ to consonant-final verbs, no vowels appear at the morpheme boundary. In order to avoid a violation of SYLLSTRUC, assimilation of the

/tob -ta/	MAX [voice] Obstruent	DEPLINK [voice]
totta	*!	
𑂔𑂗𑂢𑂰 tonda		*

/yom -ta/	MAX [nas]	DEPLINK [voice]
yotta	*!	
𑂔𑂗𑂢𑂰 yonda		*

verb-final consonants /r/ and /w/ to *t* occur. On the other hand, in the negative suffixation, there is an option to undergo contraction by syncope (nasal assimilation) or for it to remain as the full form. If contraction creates homophony, the contraction would be blocked.

4.3.3 Homophony pattern 3: Neutralization by one-way alternation

In this section, the third pattern of homophony creation in transparadigmatic relations will be reviewed. Regular verbs ending with a velar undergo *i-onbin*, another type of *onbin* in which a velar changes to *i* (see Appendix C for detail of *i-onbin*), by suffixation with the past morpheme /ta/ and the gerund /te/ such as *kik* ‘listen’ such as *kiita* (< *kik-ta*). *i-onbin* is observed across the verbs ending with a velar, except for *ik* ‘go’ which undergoes *soku-onbin* instead.

(150)	<u>Category names</u>	<u>ik ‘go’</u>	<u>kik ‘listen’</u>
	Negative	ik -anai	kik -anai
	Adverbial	ik -imasu	kik -imasu
	Present	ik -u	kik -u
	Hypothetical	ik -eba	kik -eba
	Potential	ik -e	kik -e
	Passive	ik -are	kik -are
	Imperative 1	ik -e	kik -e
	Imperative 2	ik -ina	kik -ina
	Polite Imperative	ik -inasai	kik -inasai
	Tentative	ik -oo	kik -oo
	Causative	ik -ase	kik -ase
	Past	<u>it</u> -ta	<u>ki</u> -ta
	Gerund	<u>it</u> -te	<u>ki</u> -te

Other than *ik*, all of the other verbs ending with a velar undergo *i-onbin*.

- (151) *ik* -te → *itte*
 go GER
ak -te → *aite*
 open GER
uk -te → *uite*
 float GER
kik -te → *kiite*
 listen GER
sik -te → *siite*
 lay GER
hik -te → *hiite*
 pull GER

As a result, past /ta/ suffixation and gerund /te/ suffixation create homophony with *iw* ‘say’ which also undergoes *soku-onbin*.

- (152) a. *ik* -ta → *itta* (*soku-onbin*), **iita* (*i-onbin*)
 go PAST
iw -ta → *itta* (*soku-onbin*)
 say PAST
 b. *ik* -te → *itte* (*soku-onbin*), **iite* (*i-onbin*)
 go GER
iw -te → *itte* (*soku-onbin*)
 say GER

There is nothing ill-formed about *iita* and *iite*. Yet, these are not realized for *ik*. I propose that *itta* (< *ik-ta*) and *itte* (< *ik-te*) are listed as monophonemic in the lexicon as ‘go, PAST’ and ‘go, GER’ respectively, rather than being derived from *ik* ‘go’, *ta* ‘PAST’ and *te* ‘GER’ who are listed separately in the lexicon by a phonological rule. /*iw-ta*/ ‘say, PAST’ → *itta* can be accounted for by the same constraints used for /*kaw-ta*/ ‘buy, PAST’ in tableau 77.

Tableau 80

/iw-ta/ ‘say, PAST’: Full analysis

/iw-ta/	SYLLS TRUC	POSTNA sVOI	DEPLINK [voice]	MAX [son]	MAX-C	INITIAL- C	FINAL- C
a. iwta	*!						
b. it^{a} itta				*			
c. iwwa	*!		*				
d. iwa					*	*!	
e. ita					*		*!
f. inta		*!					
g. inda			*!				
h. inna			*!				

Like tableau 77, MAX-V would not be violated by any of the candidates above, and therefore, this tableau would represent the past formation of /iw-ta/ in the contraction grammar in addition to the full-form grammar by unranking INITIAL-C and FINAL-C.

The tableau below shows a MPA for homophony creation in the past formation of /itta/ ‘go, PAST’ and /iw-ta/ ‘say, PAST’ which represents both full-form and contraction grammars, using candidates a) and b) in tableau 80. Only *itta* is evaluated as an output of /itta/ because the other candidates are out of the question. There is no ranking motivation between MAX [son] and CONTRAST.

Tableau 81MPA: /itta/ ‘go, PAST’ and /iw-ta/ ‘say, PAST’ in *both* grammars

/itta/ : /iw-ta/	SYLLSTRUC	MAX [son]	CONTRAST
a. itta : iwta	:*!		
b. it^{a} itta : itta		:*	*

The candidate a) fatally violates SYLLSTRUC. As a result, b) is selected despite its violation of CONTRAST since CONTRAST is ranked lower than SYLLSTRUC. Homophony creation occurs due to a violation of SYLLSTRUC. The anti-homophony effect does not

emerge here because of violation of the constraints ranked higher than CONTRAST.

It is not necessary for *itta* (< iw-ta) and *itte* (< iw-te) to be listed as ‘say, PAST’ and ‘say, GER’ respectively because these can be derived from the phonology since *iw -ta* → *itta* and *iw -te* → *itte* are productive processes. However, even if *itta* and *itte* were listed, as they have two meanings, in other words syncretism, homophony creation is not blocked. This is because CONTRAST does not apply to a pair which is not contrastive, as you may recall from the discussion in section 3.5.

There is another case for neutralization by one-way alternation. This case for homophony creation in this section is slightly different from the last three sections because the optimal output does not violate CONTRAST. This case is homophony creation between *ku* ‘come’ and *ki* ‘wear’. As you can see in the paradigms below, the adverbial, imperative 2, and polite imperative forms are identical. *ki* is a verb with regular conjugation and *ku* is an irregular verb in which I assume several allomorphs are stored.

(153) <u>Category names</u>	<u>ku ‘come’</u>	<u>ki ‘wear’</u>
Negative	ko -nai	ki -nai
Adverbial	ki -masu	ki -masu
Present	ku -ru	ki -ru
Hypothetical	ku -reba	ki -reba
Potential	ko -rare	ki -rare
Passive	ko -rare	ki -rare
Imperative 1	ko -i	ki -ro
Imperative 2	ki -na	ki -na
Polite Imperative	ki -nasai	ki -nasai
Tentative	ko -yoo	ki -yoo
Causative	ko -sase	ki -sase
Past	ki -ta	ki -ta
Gerund	ki -te	ki -te

I will use the adverbial form as an example. When the adverbial suffix /masu/ is attached to *ku*, the stem becomes *ki*, and it becomes homophonous with the adverbial form of *ki*

‘wear’. In the adverbial form, these two verbs create homophony in both full-form and contraction grammars. Like /itta/ ‘go, PAST’ discussed in the previous section, I assume that the adverbial form of *ku* is listed as /kimasu/ in the lexicon since /kimasu/ is not computable, unlike the adverbial form of *ki* is by simple affixation of the present suffix /masu/. It may be arguable that /ki-masu/ is in fact /k-imasu/ with an /imasu/, allomorph of /masu/, added to /k/. However, /ku/ + /imasu/ → *kimasu* is not computable because /imasu/ usually attaches to a consonant-final verb but the stem /ku/ is a vowel-final verb, not just /k/.

(154) Category names ku ‘come’ ki ‘wear’
 Adverbial kimasu ki -masu


(155) In the full-form and contraction grammars
 kimasu → kimasu
 come PRES
 ki -masu → kimasu
 wear PRES

} homophony

A MPA is conducted for the pair in (155).

Tableau 82

MPA: /kimasu/ ‘come, PRES’ and /ki-masu/ ‘wear, PRES’ in the *full-form* grammar

/kimasu/ : /ki-masu/	SYLLSTRUC	MAX-V	INITIAL-C	CONTRAST	FINAL-C
a.  kimasu : kimasu				*	:*
b. kmasu : kimasu	*!:	*:			:*
c. kimasu : kmasu	:*!	:*			
d. kmasu : kmasu	*!.*	*.*			

Candidate a) does not violate MAX-V, nor would violate any possible faithfulness constraints, for example MAX-C, IDENT-V. The other candidates b), c) and d) with a

deletion of /i/ fatally violate SYLLSTRUC. Thus, homophony in d) is allowed despite a violation of CONTRAST. An analysis in the contraction grammar is as follows.

Tableau 83

MPA: /kimasu/ ‘come, PRES’ and /ki-masu/ ‘wear, PRES’ in the *contraction* grammar

/kimasu/ : /ki-masu/	SYLLSTRUC	INITIAL-C	CONTRAST	FINAL-C	MAX-V
a. ✗ kimasu : kimasu			*	:*	
b. kmasu : kimasu	*!:			:*	*:
c. kimasu : kmasu	:*!				:*
d. kmasu : kmasu	*!.*				*:*

In the contraction grammar, homophony is also created due to a fatal violation of SYLLSTRUC by candidates b), c) and d).

4.4 Anti-homophony principle: phonology-internal vs. phonology-external

To the extent that anti-homophony blocking is not the sort of principle we traditionally associate with purely phonological processes as it concerns the interaction of the phonology with the lexicon, we might imagine that the right way of treating it is not with a ranked constraint within the phonology, but rather with some sort of filter on the output of the phonology. We might think that anti-homophony blocking is some sort of principle that lets the phonology do what it wants, but then comes along afterward and disallows certain results on the basis of the anti-homophony principle. In this section, I will examine whether the anti-homophony principle can be such a phonology-external device. Also, using the principle of Lexicon Optimization (Prince and Smolensky 1993), I will introduce the “extended LO (Lexicon Optimization) approach” used to determine which possible concatenation of already learned morphemes should be chosen upon parsing a

given output form in the adult grammar. However, I will demonstrate that the extended LO approach cannot account for cases of homophony creation because although it is sensitive to phonology, it is not a phonology-internal device. I will therefore argue that the anti-homophony constraint CONTRAST must be phonology-internal and it accounts for not only anti-homophony blocking but also homophony creation as a violable constraint embedded in the phonological grammar.

First, a phonology-external device will be examined. This would be a principle that lets the phonology do what it wants first, and then afterwards disallows homophony creation. Tableau 84 shows single analyses of /wakar-anai/ ‘understand, NEG’ and /wakare-nai/ ‘get separated, NEG’ using INITIAL-C >> FINAL-C along with MAX-V (without using CONTRAST). Both tableaux show that /wakare-nai/ undergoes nasal assimilation, which of course is not supposed to occur as indicated by the bombs.

Tableau 84

Single analysis of /wakar-anai/ and /wakare-nai/:

INITIAL-C >> FINAL-C >> MAX-V

a. /wakar-anai/	INITIAL-C	FINAL-C	MAX-V
wakar an ai	*!		
☞ wak ann ai			*
b. /wakare-nai/	INITIAL-C	FINAL-C	MAX-V
wakare n ai		*!	
☛ wak ann ai			*

After the optimal outputs are selected, the phonology-external anti-homophony principle prohibits the homophony in the outputs.

(156)	wakar	-anai	→	☞ wakannai	}	*
	understand	NEG				
	wakare	-nai	→	●☞ wakannai	}	↑
	get separated	NEG				

phonology-external anti-homophony principle

The phonology-external anti-homophony principle merely prohibits the realization of homophony but since it is not part of phonological grammar, it cannot see how phonology resolves homophony creation, namely only /wakar-anai/ undergoes nasal assimilation and nasal assimilation of /wakare-nai/ is blocked. CONTRAST as a phonology-internal anti-homophony principle, on the other hand, not only prohibits homophony creation but also lets the other constraints determine nasal assimilation of which inputs is blocked as a resolution as we saw in tableau 51, repeated below as tableau 85.

Tableau 85

Minimal Pair Analysis: INITIAL-C, CONTRAST >> FINAL-C >> MAX-V

/wakar-anai : wakare-nai/	INITIAL-C	CONTRAST	FINAL-C	MAX-V
a. wakaranai : wakarenai	*!:	:	:*	:
b. ☞ wakannai : wakarenai	:	:	:*	*:
c. wakaranai : wakannai	*!:	:	:	:*
d. wakannai : wakannai	:	*!	:	*.*

A phonology-external device cannot do that because it is not part of the grammar.

Next, I will examine the “extended LO approach.” It is sensitive to phonology in terms of identifying the underlying form, however, it is not quite phonology-internal. The original proposal of Lexicon Optimization is reviewed first. Prince and Smolensky (1993:192) defines Lexicon Optimization as:

(157) Lexicon Optimization

Suppose that several different inputs I_1, I_2, \dots, I_n when parsed by a grammar G lead to corresponding outputs O_1, O_2, \dots, O_n , all of which are realized as the same phonetic form Φ – these inputs are all *phonetically equivalent* with respect to G . Now one of these inputs must be the most harmonic, by virtue of incurring the least significant violation marks: suppose this optimal one is labelled O_k . Then the learner should choose, as the underlying form for Φ , the input I_k .

In other words, out of several potential inputs whose optimal outputs converge to the same phonetic realizations, the one most harmonic to the output should be chosen.

“Harmony” is defined as follows: “(H)armony is a kind of relative well-formedness, taking into account the severity of the violations of individual constraints, as determined by their hierarchical ranking. That is, violation of a higher-ranked constraint incurs a greater cost to harmony than violation of a lower-ranked constraint” (Kager 1999:8-9). In other words, an input with fewer violations of higher-ranked constraints is more harmonic.

Lexicon Optimization minimizes deep/surface disparity in its selection of underlying forms (Tesar and Smolensky 2000). This principle was introduced to argue for the learnability of the language-dependent underlying forms of morphemes, namely to address which of the universally available inputs is paired with a particular morpheme, in other words, to acquire new lexical entries. Given that phonetic form heard in the environment, the child figures out how to assign phonological and morphological structure to that form and store that structure in the lexicon. Lexicon Optimization has been utilized by other researchers to argue for the necessity of underspecification of the underlying form of a predictable and alternating surface forms (Inkelas 1995), and for the

recoverability of schwa in the underlying form from a full vowel in the surface in Coast Salish (Urbanczyk 2002), to name a few.

The Lexicon Optimization mechanism has not been used outside the acquisition domain. Once the morpheme is stored, Lexicon Optimization plays no further role in its evaluation since the “lexicon” (list of stored morphemes) has been “optimized.” I will attempt to extend this principle as a general mechanism beyond the acquisition of lexicon, not from a learnability standpoint, but for determining which possible concatenation of already learned morphemes should be chosen upon parsing a given output form in an adult grammar. The “extended LO approach” can be utilized to account for the anti-homophony blocking in the pair below, by using slightly different constraints.

- (158) **wakar** **-anai** → **wakannai**
 understand NEG
 wakare **-nai** → ***wakannai**
 get separated NEG

As introduced in footnote 40, another approach for this type of anti-homophony blocking is to divide MAX-V into MAX-V_{root} and MAX-V_{affix} and rank them as MAX-V_{root} >> MAX-V_{affix} instead of using ranking INITIAL-C >> FINAL-C.

- (159) MAX-V_{root}: Every vowel in root in input has a correspondent in output.
 MAX-V_{affix}: Every vowel in affix in input has a correspondent in output.

Single analyses of each nasal assimilation using these MAX-V constraints along with unranked INITIAL-C and FINAL-C are shown in tableau 86.

Tableau 86

Single analysis of /wakar-anai/ and /wakare-nai/:

INITIAL-C, FINAL-C >> MAX-V_{root} >> MAX-V_{affix}

/wakar-anai/	INITIAL-C	FINAL-C	MAX-V _{root}	MAX-V _{affix}
wakar [⦿] anai	*!			
☞ wakannai				*
/wakare-nai/				
wakare [⦿] nai		*!		
☞ wakannai			*	

Compare this tableau with single analyses using INITIAL-C >> FINAL-C along with MAX-V in tableau 84, repeated below as tableau 87.

Tableau 87

Single analysis of /wakar-anai/ and /wakare-nai/:

INITIAL-C >> FINAL-C >> MAX-V

a.	/wakar-anai/	INITIAL-C	FINAL-C	MAX-V
	wakar [⦿] anai	*!		
	☞ wakannai			*
b.	/wakare-nai/			
	wakare [⦿] nai		*!	
	☞ wakannai			*

The difference between the two tableaux, however, is that the harmonic levels of the winning candidates with the correspondent inputs are different in tableau 86 while the harmonic levels of the winning candidates with the correspondent inputs are the same in tableau 87. In order to apply the mechanism of Lexicon Optimization to tableau 86, I rewrite it using a technique called “tableau des tableaux,” following Itô, Mester and Padgett (1995), in which we can compare each of the optimal outputs to see its harmonic status to the corresponding input. In the tableau des tableaux, the optimal outputs of both analyses are compared to determine which output is ultimately optimal as the surface

form of the input. This tableau des tableaux below successfully demonstrates that only /wakar-anai/ undergoes nasal assimilation.

Tableau 88

Tableau des tableaux: /wakar-anai/ vs. /wakare-nai/

Input	Output	INITIAL-C	FINAL-C	MAX-V _{root}	MAX-V _{affix}
☞ /wakar-anai/	☞ wakannai				*
/wakare-nai/	☞ wakannai			*!	

So far, I have demonstrated that the extended LO approach is able to account for anti-homophony blocking by using different constraints.

Now, I will show that the extended LO approach does not work in accounting for a homophony creation, out of competing underlying forms in the lexicon, because anti-homophony principle must be a constraint ranked along with the other constraints in the phonology. One of such cases where the extended LO approach fails is the homophony creation by *soku-onbin* between /kaw-ta/ and /kar-ta/ in the full-form and contraction grammar as shown in (143b), repeated below as (160).

- (160) kaw -ta → katta
 buy PAST
 kar -ta → katta
 clip PAST
- } homophony

In tableaux 77 and 78 in section 4.3.2, I showed single analyses of each *soku-onbin*, repeated below as tableau 89 by only showing the winner. MAX-V is not shown, nor MAX-V_{root} /MAX-V_{affix}, in the tableau because there would be no violation of these constraints. Note that I will leave the ranking between INITIAL-C and FINAL-C (INITIAL-C >> FINAL-C) as it is in the tableaux 77 and 78, rather than unranking them as it should be

if we use $\text{MAX-V}_{\text{root}}$ nor $\text{MAX-V}_{\text{affix}}$, because the ranking between the two would not contribute anything to the analysis.

Tableau 89

Soku-onbin of /kar-ta/: Full analysis

/kaw-ta/	SYLLS TRUC	POSTNA sVOI	DEPLINK [voice]	MAX [son]	MAX-C	INITIAL- C	FINAL- C
☞ katta				*			
/kar-ta/							
☞ katta				*			

In order to account for this homophony creation, only using $\text{MAX} [\text{son}]$ was sufficient in section 4.3.2. However, since the extended LO approach looks for differences in the harmonic level, it is necessary to further determine the harmonic level. there is a crucial difference between /w/ and /ɾ/ in terms of alternating to *t*, namely the former adds coronal but the latter does not. It means that using $\text{DEPLINK} [\text{cor}]$ defined below, the former violates this constraint but the latter does not.

(161) $\text{DEPLINK} [\text{cor}]$: Do not add a [coronal] feature to a segment that it did not have underlyingly.

Since /kaw-ta/ → *katta* occurs, this constraint must be ranked lower than SYLLSTRUC but there is no motivation of its ranking relative to $\text{MAX} [\text{son}]$. The tableau below is a rewrite of tableau 89 using only the constraints which are violated, namely $\text{MAX} [\text{son}]$ and $\text{DEPLINK} [\text{cor}]$.

Tableau 90

Soku-onbin of /kar-ta/: Analysis with DEP LINK [cor]

/kaw-ta/	MAX [son]	DEP LINK [cor]
☞ katta	*	*
/kar-ta/		
☞ katta	*	

The tableau des tableaux below shows that the extended LO approach chooses only /kar-ta/ is the input of *katta*. It fails to account for the fact that /kaw-ta/ is also the input of *katta* as homophony is created.

Tableau 91

Tableau des tableaux: /kaw-ta/ vs./kar-ta/ in *both* grammars

Input	Output	MAX [son]	DEP LINK [cor]
/kaw-ta/	☞ katta	*	*!
☞ /kar-ta/	☞ katta	*	

Compare this with tableau 92 below, the same as tableau 79 but adding DEP LINK [cor], where the anti-homophony constraint CONTRAST is able to explain the homophony creation. All the candidate sets except for candidate d) violate the highest ranked constraint SYLLSTRUC and homophonous output set a) is selected despite its violation of CONTRAST.

Tableau 92

MPA: *Soku-onbin* in *both* grammars

/kaw-ta : kar-ta/	SYLLSTRUC	MAX [son]	DEP LINK [cor]	CONTRAST
a. kawta : karta	*!:*			
b. katta : karta	:*!	*:	*:	
c. kawta : katta	*!:	:*		
d. ☞ katta : katta		*:*	*:	*

The problem with the extended LO approach is that it should never be able to allow homophony to arise as it always finds the difference in the harmonic levels in any given winning outputs in comparison unless they are underlyingly identical, as in the case of syncretism. The LO principle is a metagrammatical principle which is not quite internal to the constraint ranking. It merely chooses the winner by the harmonic levels of the two outputs to the inputs. CONTRAST, on the other hand, is a ranked constraint internal to the phonology, and its operation is inextricably linked with the operation of those other constraints. CONTRAST can be outranked by another constraint such as MAX-V, and as a result of a violation of MAX-V, homophony is created despite the fact the homophonous output set violates CONTRAST. The extended LO approach cannot do that because it does not see that SYLLSTRUC is more important than maintaining the contrast in the two outputs.


Another case in which the extended LO approach cannot account for homophony creation is when one input alternates but the other does not, such as a case of homophony creation of verb *ik*, discussed in (152a), repeated here as (162)

- (162) *ik* -ta → itta (soku-onbin), *iita (i-onbin)
 go PAST
 iw -ta → itta (soku-onbin)
 say PAST

In tableau 80, repeated below as tableau 89, *soku-onbin* of /iw-ta/ was accounted for.

Tableau 93



/iw-ta/ ‘say, PAST’: Full analysis

/iw-ta/	SYLLS TRUC	POSTNA sVOI	DEPLINK [voice]	MAX [son]	MAX-C	INITIAL- C	FINAL- C
a. iwta	*!						
b.  itta				*			
c. iwwa	*!		*				
d. iwa					*	*!	
e. ita					*		*!
f. inta		*!					
g. inda			*!				
h. inna			*!				

The tableaux below individual analyses, using the same constraints as above. Recall my claim in section 4.3.3 that *itta* is listed as monophonemic in the lexicon as ‘go, PAST’, rather than being derived from *ik* ‘go’ + *ta* ‘PAST’. Therefore, *itta* is the most faithful to the input /itta/, and there is no need to evaluate candidates other than *itta*.

Tableau 94




Soku-onbin of /itta/ ‘go, PAST’ and /iw-ta/ ‘say, PAST’

/itta/ ‘go, PAST’	SYLLSTRUC	POSTNASVOI	DEPLINK [voice]	MAX [son]
 itta				
/iw-ta/ ‘say, PAST’				
iwta	*!			
 itta				*

We use a tableau de tableaux for the extended LO approach.

Tableau 95

Tableau de tableaux: Soku-onbin of /itta/ ‘go, PAST’ and /iw-ta/ ‘say, PAST’

Input	Output	SYLLSTRUC	POSTNASVOI	DEPLINK [voice]	MAX [son]
 /itta/	 itta				
/iw-ta/	 itta				*!

As a result, the extended LO approach selects only /itta/ → *itta* as optimal although both /itta/ and /iw-ta/ must have been realized as *itta*. Thus, using the constraints and the ranking which were established, the extended LO approach failed to account for the fact that both /itta/ and /iw-ta/ is realized as *itta* on the surface. It is because the output *itta* is completely faithful to /itta/ without a violation of any constraints, while /iw-ta/ → *itta* always violates at least one constraint. Again, the problem with the extended LO approach arises due to the fact that the LO principle is not ranked and violable as it is not embedded in the phonological grammar. Compare tableau 95 with MPA with CONTRAST in tableau 81, repeated here as tableau 96.

Tableau 96

MPA: /itta/ ‘go, PAST’ and /iw-ta/ ‘say, PAST’ in *both* grammars

/itta/ : /iw-ta/	SYLLSTRUC	MAX [son]	CONTRAST
a. itta : iwta	:*!		
b. ☞ itta : itta		:*	*

Note that no violation is incurred when /itta/ surfaces as *itta* just like in tableau 95. Candidate b), the homophonous output set, is selected despite the violation of CONTRAST because CONTRAST, a violable constraint, is ranked lower than SYLLSTRUC. This is only possible because CONTRAST is a ranked constraint internal to the phonology.

In conclusion, I have demonstrated that the anti-homophony principle must be part of the phonological grammar as a constraint internal to the phonology. The anti-homophony constraint CONTRAST is able to account for the resolution of anti-homophony blocking and homophony creation because it can outrank other constraints and can be

outranked by the other constraints. In other words, the anti-homophony principle must be phonology-internal which is embedded in the grammar.

4.5 Relativized faithfulness constraint and two grammars

In earlier sections in this chapter, the constraints and their ranking as well as homophony creation in the full-form and contraction grammars have been discussed. In this section, the relationship between the two grammars will be discussed. First, I will review several researchers' treatment of variation in OT.

There are several accounts for variation in grammar within the OT framework. "Cogrammar," or "cophonology" (Inkelas et al. 1997, among others), is one of them. In this model, two (or more) grammars coexist and the ranking of the constraints within each grammar is fixed, as in traditional OT, and only one grammar is selected at a time. The different output is a result of which grammar the speaker chooses at a given time of speech production. The second account is the "nonfixed model" or "free ranking model" where constraints are rerankable within a single grammar, which in effect leads to two or more subgrammars or subhierarchies. Subgrammars differ only in constraints whose ranking is not stipulated by the grammar. This approach is similar to the "cophonology" approach but the crucial difference is that in the free ranking approach, the degree of dissimilarity between variable output forms and the number of variable outputs are positively correlated while in cophonology, the ranking of different cophonologies are intrinsically unrelated (Kagar 1999). There are two cases within this account. In one case, the ranking of two constraints is not fixed and therefore, one can outrank the other or vice

versa (Anttila 1997, Anttila and Cho 1998), which is referred to as “partial ranking.” In the other case, one constraint is not ranked categorically in a hierarchy and can float to any position within a set of constraints (Reynolds 1994, Nagy and Reynolds 1997). The third account is stochastic OT in the Gradual Learning Algorithm by Boersma (1997) and Boersma and Hayes (1999). In this model, it is presupposed that there is a linear scale of constraint strictness, in which higher values correspond to higher-ranked constraints. In the speech process, the position of each constraint is temporarily perturbed by a random positive or negative value, the constraints act as if they were associated with a range of values, instead of a single point. With such stochastic positions of the constraints at the evaluation of the candidate, the grammar can produce variable outputs if the ranges of two constraints with equal standard deviation overlap. (For a general discussion on variation in OT, except for Gradual Learning Algorithm, see Zubritskaya 1997 and Kagar 1999).

In the Japanese case at hand, contracted forms and full forms coexist not only among the speakers of the language (see Saito 1991), but also within an individual speaker. Contracted forms (labial contraction, nasal assimilation and /te/ contraction, in boldfaced below) and full forms (underlined) can appear interchangeably within a single sentence. The selection of the forms most likely has to do with sociolinguistic or individual factors of speakers who use contracted forms, and such details are beyond the scope of this dissertation (see section 5.2.3, however, for a brief discussion of the influence of sociolinguistic factors on the occurrence of nasal assimilation).

- (163) boku-wa yoku wakar -anai kedo sokoni kai-te-oku yo
 I TOP well understand NEG although there write-GER-put sentence ending
 ‘I don’t understand very well but I will write it there (for future purpose).’
- bokuwa yoku wakaranai kedo sokoni kaiteoku yo
 → **bokaa** yoku wakaranai kedo sokoni **kaitoku** yo
 → bokuwa yoku **wakannai** kedo sokoni kaiteoku yo
 → **bokaa** yoku **wakannai** kedo sokoni **kaitoku** yo

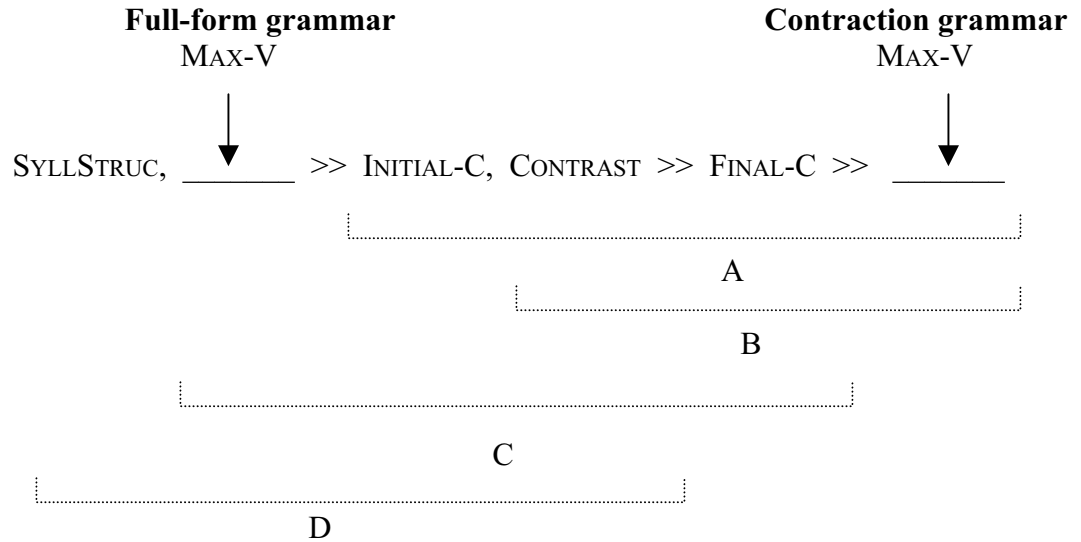
This coexistence of the two forms is not surprising, considering that code-switching between two phonologically completely separate languages/grammars within a sentence does occur.⁴⁹ I will soon demonstrate that the “nonfixed model” is an appropriate model to account for the variation of two grammars in Japanese.

The chart demonstrates that there are two positions available for MAX-V, one for the full-form grammar and the other for the contraction grammar.

⁴⁹One example of code-switching between English and Spanish is as below.

- (i) *Anyway, yo creo que que las personas who support todos estos grupos como los Friends of the Earth son personas que are very close to nature.* (Moyer 1992, cited in Lipski 2005)

(164) Relativized faithfulness constraint MAX-V and the realization of two grammars



- A: Occurrence of contraction in the contraction grammar
(Single analysis without CONTRAST)
INITIAL-C >> MAX-V
FINAL-C >> MAX-V
- B: Anti-homophony blocking in the contraction grammar (MPA)
CONTRAST >> FINAL-C >> MAX-V
- C: No contraction in the full-form grammar
(Single analysis without CONTRAST)
MAX-V >> INITIAL-C
MAX-V >> FINAL-C
- D: Homophony creation in the full-form and contraction grammars (MPA)
SYLLSTRUC, MAX-V >> CONTRAST

In the contraction grammar, contraction occurs because INITIAL-C and FINAL-C outrank MAX-V, marked as A. The presence of contraction was demonstrated in tableaux 8, 10, 15 and 16. When there is a homophony threat by contraction, the contraction (driven by the ranking INITIAL-C and FINAL-C) on one member of a pair in question, is blocked by the anti-homophony constraint CONTRAST ranked higher than FINAL-C, one of the constraints which drives the syncope, marked as B. Anti-homophony blocking was demonstrated in tableaux 51 and 52. In the full-form grammar, no contraction occurs

because MAX-V is ranked higher than INITIAL-C and FINAL-C, marked as C.⁵⁰ We see the nonoccurrence of contraction in tableaux 63 and 65. In both the full-form and contraction grammars, there are some cases in which homophony is created. It is because all candidates, except for the candidate which violates CONTRAST, are ruled out due to a fatal violation of the constraints ranked higher than CONTRAST (SYLLSTRUC and MAX-V in the full-form grammar, and SYLLSTRUC in the contraction grammar), marked as D. Homophony creation was demonstrated in tableaux 68 (70), 79, 81, 82 and 83.

In the contraction and full-form grammars, the markedness constraints have a single ranking but the faithfulness constraint MAX-V can be relativized. The relativized faithfulness constraint can be ranked in one of two possible positions in the hierarchy to provide different surface results by different grammars. This relativized faithfulness constraint model is an example of the “nonfixed model” of two possible positions for MAX-V within a single constraint order, which leads to two subgrammars. However, it does not mean that the other accounts for variation in OT would not work for the case at hand.

Note that in the full-form grammar, the ranking between CONTRAST and FINAL-C is not yet established. Since these constraints are ranked relatively lower in the full-form grammar, a precise ranking is difficult to determine by an example, which motivates the exact ranking.

⁵⁰ van Oostendorp (1998) claims that the more formal the register, the higher ranked faithfulness constraints. The contracted forms in Japanese can occur in formal speech but there is still a tendency that full forms occur in formal speech and contracted forms occur in informal speech. van Oostendorp’s observation reinforces my claim that MAX-V ranks higher in the full-form grammar than that in the contraction grammar.

A question arises as to whether another possible position of MAX-V is available, namely midway between the full-form grammar and contraction grammar, as shown below. If MAX-V can float to any position within this set of constraints like “floating constraint” model in Reynolds (1994), Nagy and Reynolds (1997), the position below should also be available.

(165) Another possible position of MAX-V



Is this ranking possible? This grammar predicts that vowels would be preserved even if it means that morphemes are attached to vowel-final bases, but would still drop in order to allow morphemes to be consonant-final. It means that consonant-final verbs always undergo nasal assimilation and vowel-final verbs never undergo nasal assimilation as below.

- (166) a. wakar -anai → wakannai
 understand NEG
 b. wakar -anai → wakarenai
 get separated NEG
 c. kure -nai → *kunnai (⊗)
 give (me) NEG

Nonoccurrence of nasal assimilation in (166b), then, is not due to the anti-homophony principle but due to the fact that in this grammar vowel-final verbs never undergo nasal assimilation even when there is no /r-anai/ counter part. This scenario makes false predictions as shown because /kure-nai/ in (166c) should undergo nasal assimilation when /wakar-anai/ in (166a) undergoes nasal assimilation. This grammar does not seem to exist.

Recall that it was discussed in chapter 1 that no researchers have demonstrated a case of anti-homophony blocking in transparadigmatic relations except for the Japanese case. In this chapter, it was shown that nasal assimilation in the contraction grammar is the only case that we know of that the anti-homophony constraint CONTRAST is in effect in blocking homophony creation due to the “Emergence of the Unmarked” effect in Japanese contracted forms. Such an effect is not always observed due to the fact that CONTRAST is a violable constraint and is in fact dominated by other constraints. However, it is not the reason why anti-homophony blocking is almost unattested in transparadigmatic relations. There is no reason to believe that anti-homophony blocking in transparadigmatic relations is rarer than that in paradigmatic relations. We just do not know for sure at this point. It seems to be true that CONTRAST in general is not ranked high enough to have an effect. Why CONTRAST isn’t ranked higher in many languages’ grammar is an open question. I leave it to future research.

4.6 Summary

In this chapter, I have established the ranking of the constraints in the full-form grammar. It was argued that the full-form grammar is crucially different from the contraction grammar in the position of faithfulness constraint MAX-V, namely MAX-V is ranked higher than INITIAL-C, CONTRAST and FINAL-C in the former, and lower in the latter. The relativized MAX-V provides different outputs by subgrammars by ranking in different positions in the hierarchy. Assuming that the anti-homophony constraint CONTRAST exists in the full-form, I have reviewed several cases for homophony creation which are

potentially counterevidence of anti-homophony blocking. I have argued that homophony is allowed due to violations of the constraints ranked higher than the anti-homophony constraint CONTRAST. The anti-homophony effect emerges only when CONTRAST is violated but there is no violation of constraints ranked higher than CONTRAST. In nasal assimilation, anti-homophony blocking is observed in the contraction grammar due to such “Emergence of the Unmarked” effect. I have demonstrated that the anti-homophony principle must be embedded in the phonological grammar as an outrankable and violable constraint internal to the phonology. Unless it is a phonology-internal device, the anti-homophony principle cannot account for the resolution of anti-homophony blocking and homophony creation because anti-homophony principle must be part of the phonological grammar.