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Relation	



Unveiling Consonant Harmony: Nonlexical reduplication in English

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Abstract: There is a lack of strong diachronic evidence in English phonology to demonstrate consonant harmony (hereafter CH) in reduplication (Fikkert et al. 2005; Goad & Buckley 2006; Hale & Reiss 2008; Pater & Werle 2003; Rose 2000; Wolfram & Johnson 1982). In the present study, we investigated CH in synchronic settings wherein native English speakers were asked to produce a euphonious pseudo reduplicant from a nonce base in uncontrolled and controlled experiments. The results of the experiments indicated that, in English, consonantal assimilations might have a hierarchical structure when CH is present in the synchronic formation of a rhyming reduplicant. Taken holistically, these findings suggest that the rate of coronal assimilation exceeds that of labial assimilation. The occurrence of dorsal assimilation may be restricted even further by the scarcity of word-initial dorsal onsets that meet the requirements for rhyming reduplication.

Key words: consonant harmony, reduplication, dorsal onset avoidance, inter-speaker variation

1. Introduction

CH is in and of itself a restricted form of full reduplication, generally defined as a phonological process in which non-neighboring consonants share

the place or manner of articulation (Pater 1997). As regularly observed in the regressive assimilation by children learning their first language, *drink* [grik], *dog* [gɔg], *yellow* [lɛlo], and *sun* [nʌn] in child English (Wolfram & Johnson 1982; Bybee 2001), as well as *chapeau* [popo], *debout* [babu], and *partout* [tatu:] in child French (Deville 1891; Goad & Buckley 2006; Rose 2000), are real-life samples of CH, all of which suggest that a developing language is circumscribed by a blend of biological and neurological factors (Skaer 2004). However, little is known regarding whether, by experiment, an adult synchronic English grammar allows for consonant assimilation in the reduplicant. In effect, representative words, such as *ragtag* and *super-duper*, demonstrating CH in terms of the Place of Articulation (hereafter PoA) are not numerous in English. The feature coronal is commonly shared by the onset of the base *rag* with the reduplicant *tag*, where the natural class of a consonant which intervenes between base and reduplicant may not have a bearing upon the choice of a rhyming onset of the reduplicant. The identical consonant almost never fills the syllable-final and the syllable-initial consonant position without some changes (Bybee 2001).

The goal of the present study is to bring a different perspective to the grammar of English reduplication by conducting experimental

studies in order to provide deeper understanding of the reduplicative processes of English. The present study is an extension of previous studies (Kobayashi 2017_a; 2017_b). Spontaneously produced reduplicants, as addressed here, may well provide sources of insight into the nature of English reduplication, as well as other areas of rule formation and violation, such as found in Fromkin (1973)'s study of speech errors. By implementing a set of reduplicating tasks with a significant number of informants, it would be worth culling nonsensical rhyming reduplicants and accordingly determine whether the synchronically generated reduplicants may provide positive evidence on CH. We assume that given prepared inputs, euphonious rhyming reduplicants for individual informants would differ, leading us to predict that informants with different daily language experiences will react differently to the inputs (Brand & Ernestus 2018; Bybee 2001). Therefore, there is a likelihood that the conducting of the reduplicating tasks may not yield outputs supporting the evidence for CH in the synchronic settings, but as such the experiment may help us observe part of the linguistic process by which a euphonious nonsensical reduplicant is generated in the human mind.

In this article, section 2 provides theoretical schemata that are necessary for the study of CH in English reduplication. Section 3 outlines a series of tasks the authors carried out with the informants to verify the presence or the lack of CH between the base onset and the rhyming reduplicative onset. Section 4 concludes the analysis.

2. Theoretical Premises

2.1 English Reduplicative Words

Crystal (2003) suggests that ablaut and rhyming reduplication represent the standard (partial) reduplication in English, as exemplified in (1a) and (1b) whereas, as shown in (1c), the identical (complete) reduplication is rare. Since English

“has no system of infixes” (Crystal 2003: 128), infixing reduplication, as listed typically in (1d), is much rarer in English than any other type of reduplication. Occasionally, English allows infixation for the purpose of making emphasis or in swearing, as shown in (1e). These representative reduplicative words are in current use (Kobayashi & Skaer 2018);

(1) Reduplicative Words

- a. *criss-cross* [krɪs.krɒs], *riff-raff* [rɪf.ræf],
jibber-jabber [dʒɪb.ə.dʒæb.ə]
- b. *loosey-goosey* [lu.si.gu.si], *helter-skelter* [hel.tər skel.tər], *boogie-woogie* [bʊ.gɪ.wʊ.gɪ]
- c. *bye-bye* [baɪ.baɪ], *swish-swish* [swɪʃ.swɪʃ], *din-din* [dɪn.dɪn]
- d. *tit for tat* [tɪt.fər.tæt] (or [tɪt.fə.tæt]), *bric-a-brac* [brɪk.ə.bræk], *blankety-blank* [blæŋkɪ.tɪ.blæŋk]
- e. *Ala-fukin-bama* [ælə. fʌk.ɪŋ.bæm.ə] (McCarthy 1982), *fan-fukin-tastic* [fæn.fʌk.ɪŋ.tæs.tɪk] (McCarthy 1982), *abso-blooming-lutely* [æb.sə.blʊ:m.ɪŋ.lu.tə.li:] (Crystal 2010), *Kalama-goddam-zoo* [ka.lə.mə.gəd.dæm.zu:] (Zwicky & Pullum 1987)ⁱ

The directionality of reduplication enters into our consideration when we examine what segmental feature(s) of the base is(are) transferred to the reduplicant. Jespersen (1942/1965: 174) calls the left part of a reduplicative word “kernel,” and conventionally the kernel forms the base and the right part of the word is developed to produce the reduplicated form in English. The present study adopts this view on the directionality of reduplication in English. As “[t]he phonological forces which determine the left-to-right linear order of base and reduplicant operate without regard for whether either half of the new word is already present in the vocabulary” lexicon of native English speakers (Minkova 2002: 137), lexical reduplicantsⁱⁱ such as *tow* in *kowtow* and *goosey*

in *loosey-goosey* are generated from non-lexical bases *kow* and *loosey* respectively. Conversely, nonlexical reduplicants such as *jabber* in *jibber-jabber* and *raff* in *riff-raff* are derived from lexical bases *jibber* and *riff*. Seen in such a context, Boris Johnson, the new British Prime Minister, uniquely reduplicated the rhyming *gloomsters* from the immediately preceding word *doomsters* in his first speech on July 24th in 2019 (Johnson 2019). Once again, this confirms that a nonlexical word can be reduplicated from a real word, as well as the left-to-right directionality of reduplication in English.

2.2 Markedness Constraints

The present study adopts an Optimality Theoretic constraint-based approach to accounting for the evidence supporting CH in the synchronic phonology. This is done largely because the reduplicating tasks in the experiments are likely to yield varying strands of outputs depending on a combination of the prepared inputs and the informants with varied daily language experiences. As Honeybone (2011: 171) states that “[m]ost of the work on phonological theory which *does* engage with variation is now conducted in” (emphasis is original) Optimality Theory (Prince & Smolensky 1993/2004) or OT, the present study analyzes inter-speaker variation in OT. The accounting for the synchronically generated rhyming reduplicants on the rule-based approach goes beyond the scope of this work. In effect, variation is not sufficiently addressed by rewrite-rules (Pierrehumbert 1994). In this section, we review the basic framework of a constraint-based approach to reduplication. The OT grammar, as proposed by Prince & Smolesnky (1993/2004) and McCarthy & Prince (1994), maintains that both base and reduplicant are treated as a set of outputs (Minkova 2002). The base has its own input and accordingly the output for the base is generated from the input whereas the reduplicant does not have its own input. There is no restriction on the

input form under *the principle of the Richness of the Base* (Prince & Smolensky 1993/2004).

We now turn to an important question: *How* is it that the reduplicant is generated? In order to consider this question, the concept of Correspondence helps us verify the matching of the input with the output of the base and the matching of the output for the base with the corresponding reduplicant as well (Crosswhite 1998). The reduplicant is generated from the output form for the base, and hence technically speaking, the base and reduplicant are treated a string of outputs in OT (Minkova 2002).

The *IO-Faithfulness* constraints are aligned to resolve any discrepancy between the input and the output for the base; for instance, segmental deletion and epenthesis in the output are noted, if any. In contrast, *BR-Identity* identifies any disparity between the output base and the reduplicant. Let us consider a representative example of rhyming reduplication $/ræg + RED/ \rightarrow [ræg.tæg]$ in Correspondence Theory (McCarthy & Prince 1995), where first of all, GEN generates the output base $[ræg]$ from the input $/ræg/$ (the acronym RED stands for a reduplicated form). The suffixing reduplicant $[tæg]$ is generated from the output base. This process of rhyming reduplication shows that IO-Faithfulness has been entirely respected in that the output base copies the identical segments from those in the input whereas BR-Identity is not entirely respected because, instead of fully reduplicating, *tag* $[tæg]$ contains a new rhyming onset $[t]$ replacing the $/r/$ in its onset position.

With this in mind, what needs to be questioned further is what determines the shape of reduplicative segments, typically rhyming onsets and nucleus vowel alternation. Markedness constraints play a crucial role in determining the segments of these partial reduplicants while the markedness constraints interact with faithfulness constraints whose roles are to preserve the faithfulness of the output to the

underlying representation. When IO-Faithfulness constraints dominate markedness constraints in the generation of a partial reduplicant, it follows that the grammatical output will satisfy the highest ranked IO-Faithfulness constraints, but the reduplicant may contain segments that violate markedness constraints because the partial reduplicant invariably contains either a rhyming consonant or an ablaut that is not present originally in the base. The grammatical output for rhyming and ablaut reduplicants always contain segments that contravene BR-Identity constraints. Accordingly, the BR-Identity constraints are outranked by markedness constraints. This flow of logic concatenates into the constraint hierarchy IO-Faithfulness » Markedness » BR-Identity (hereafter ‘»’ reads as ‘dominates’), as suggested by McCarthy & Prince (1994).

3. Experimental Procedures

This section discusses two independent experiments, each of which contains two parts: a "rhyme task" and a "free task." The aim of the two experiments is to elaborate on synchronically common findings underlying the reduplicated outputs yielded by informants, if any. The rhyme task requires the informants to generate a euphonious rhyming nonsensical reduplicant from a given base as soon as possible whereas the free task requires them to do so with any type of euphonious nonsensical reduplicant from the base – i.e., full reduplicant, rhyming reduplicant, ablaut reduplicant, or infixing reduplicant. Distinctly unique linguistic stimuli of nonsensical words were created for the individual experiment. Nonexistent rhyming reduplicants are believed to be synchronically generated from the nonlexical stems (Zukoff 2012). Each of the tasks was designed to elicit from the informants “some form of expressiveness” (Bolinger 1986: 43) as psychological reality in their choice of a

euphonious nonlexical reduplicant.

The initial experiment, where 18 native English speakers participated in the tasks, was conducted from November 2015 to March, 2016. The subjects were all college-educated and without any hearing or speaking disabilities. The informants were English teachers who lived in Japan, and their age ranged from late teens to fifties. The follow-up experiment, whose nature was more controlled than the initial experiment, was conducted from January to March, 2018. A total of 11 native English informants joined this experiment. They were all university educated except one informant with secondary education, and their age range varied from twenties to seventies. All the informants were English teachers except two. They were all without hearing and speaking disabilities. Six informants in the controlled experiment had participated in the earlier uncontrolled experiment.

3.1 Uncontrolled Experiment

In the initial experiment, the informants were shown a list of linguistic stimuli on a sheet of paper and were asked to listen to a pre-recorded utterance of each stimulus on a digital audio recorder (Olympus Voice Trek V-822). This process was done one informant at a time. Each of the informants’ productions was recorded individually. The second author articulated a series of stimuli on the recorder. Thirty non-word base forms were provided with “legal” syllable structures and phonotactic sequences in English. The stimuli included monosyllabic, disyllabic, or trisyllabic, structures as partly listed in (2a), (2b), and (2c) respectively. The symbol ‘^ˈ’ indicates the assignment of primary stress in the syllable whereas the symbol ‘_ˈ’ shows the assignment of secondary stress in the syllable.

(2) Linguistic stimuli

- a. *keam* ['ki:m], *thambs* ['ðæmz], *awf* ['ɔ:f],
dween ['dwi:n], *glosh* ['glɒʃ], *gaup* ['gɔ:p]

- b. *thiglish* [ˈθɪg.lɪʃ], *striment* [ˈstraɪ.mənt], *wimax* [ˌwaɪ.ˈmæks], *chanpine* [ˌtʃæn.ˈpaɪn]
 c. *veemony* [vi.ˈmɛni:], *nooity* [ˈnu:ɪti:]

The rhyming onset consonant of a reduplicant is classified according to the PoA. The classification of consonants in terms of the PoA is illustrated in (3). The onset /w/ is not counted as a PoA regarding the initial onset of a reduplicant because /w/ is characterized as labial as well as dorsal (Hammond 1999).

(3) PoA of the rhyming onsets

- a. LABIAL: /p/, /b/, /f/, /v/, /w/
 b. CORONAL: /t/, /d/, /r/, /l/, /s/, /z/, /ʤ/, /ʃ/, /ð/, /θ/
 c. DORSAL: /g/, /k/, /w/

3.1.1 Analysis

Table 1 shows that the rhyme task yielded 384 single onset reduplicants out of 527 valid responses, whereas the free task produced 237 single onset reduplicants out of 532 valid responses. The invalid responses are due to informants' inability to generate a euphonious reduplicant from the prepared input. In fact, the rhyme task yielded thirteen invalid responses whereas the free task yielded eight invalid responses. The numeral figures without the parentheses denote the total number of reduplicative singleton onsets exhibiting a PoA identical to the base onset. The number of outputs with the complex consonantal clusters is not included in these figures without

the parentheses. The figures in the parentheses indicate the total number of reduplicants. In spite of the results showing a PoA faithful mapping from base to reduplicant, such as [vi.ˈmɛni:bi.mɛni:], [ˈθɪŋg.lɪʃ.tɪŋg.lɪʃ], and [ˈgɔ:p.kɔ:p], though, a proportion of such mapping turned out to be rather negligible. The secondary stress is not shown in the phonetic transcriptions since it is difficult or nearly impossible to identify the location of the stress from the synchronic outputs alone.

Approximately 25 percent of the valid rhyming outputs in the rhyme task yielded pieces of CH and conversely, around 27 percent of the valid rhyming outputs supported evidence of CH in the free task (percentages are approximate). There were no observed cases of dorsal assimilation in the rhyme task and only one occurrence of dorsal assimilation in the free task: [ˈgɔ:p.kɔ:p]. This makes us wonder whether the informants had deliberately avoided the dorsal consonant onset in generating a euphonious rhyming reduplicant. As far as the scope of this study covers, there is no real reduplicative word containing the dorsal onset in the base and the reduplicant. Only a handful of words, such as *hurdy-gurdy*, *hockey-cokey*, and *gang bang*, contain the dorsal in either the base or the reduplicant. Possibly the influential point of differentiation, and thus the influential attractor towards avoiding the dorsal onset of a nonlexical reduplicant may stem from the sheer absence of real reduplicative words with the dorsal onset filling the base and reduplicant.

The results in fact suggest that in the rhyme

Table 1: Instances of consonant harmony in terms of the PoA

Assimilation	Rhyme Task	Free Task
Labial	38 (200)	21 (91)
Coronal	59 (141)	43 (120)
Dorsal	0 (43)	1 (26)
Total	97 (384)	65 (237)

task, labial assimilation manifests itself through a combination of cross-linguistic markedness motivations where labials are preferred over dorsals in syllable initial position (Fikkert et al. 2005). Such a preference for the labials may well be characterized as the satisfying of active [LABIAL, as listed in (4a). Following Fikkert et al. (2005), we suggest that the coronal consonants are used as the default onset for the rhyming reduplicants. To provide statistical evidence for this claim, the following hypotheses were tested with a chi-squared test. The null hypothesis is that the informants did not discriminate labial consonants from dorsal consonants in generating rhyming reduplicants, and the alternative hypothesis is that they discriminated labials from dorsals in their production. The chi-squared test gives $\chi^2(1) = 14.08$, with a significant difference between the occurrence of labials and dorsals in the rhyming task, compared with $\chi^2(1) = 2.25$ (n.s.) regarding the occurrence of labials and dorsals in the base onsets. Accordingly, the null hypothesis is rejected with an indication that coupled, active [LABIAL and RHYME lend themselves to labial assimilation in the rhyme task. The latter constraint is defined in (4b).

(4)a. [LABIAL: The word must start with a labial consonant (Fikkert et al. 2005).

b. RHYME: The reduplicant must rhyme with the base (Yip 2001).

In this regard, it can be inferred that *the emergence of the unmarked* (also known as TETU) (McCarthy & Prince 1994) resulted from CH in terms of the PoA in the nonexistent rhyming reduplicative generation. Otherwise, CH did not emerge to a statistically significant extent. The chi-squared test gives $\chi^2(1) = 2.31$ (n.s.), indicating that in the free task, there was no significant difference between the occurrence of labials and dorsals in the rhyming reduplicative onsets.

3.2 Controlled Experiment

In the follow-up experiment with 11 informants, the procedures as employed in the uncontrolled experiment remained unchanged unless stated otherwise. The free task limited a range of reduplicative generation to three prototypes: rhyme, ablaut and identical reduplication. The linguistic stimuli, as partly outlined in (5), were recorded on the digital audio recorder (Sony ICD-UX502). A British speaker articulated the stimuli on the recorder. Trisyllabic stimuli were not used because of their rarity in ‘real reduplicative words’ (Kobayashi & Skaer 2018), thus all the 24 stimuli were either monosyllabic or disyllabic nonce words. The stimuli starting with /b/ (labial voiced stop) and /m/ (labial nasal) were omitted in the second experiment because we wanted to find out effects of such absence of the stimulus on the overall reduplicative outcomes, if any.

(5) Linguistic stimuli

a. *skeeg* ['ski:g], *loak* ['lɔ:k], *thec* ['ðɛk],
screanst ['skri:nst], *blok* ['blɔ:k]

b. *prooden* ['pru:dən], *chiker* ['tʃɪk.ər], *hoppid*
[ˈhɒp.ɪd], *jaffish* [ˌdʒæ.'fɪʃ], *gollow* [gə.'ləʊ]

3.2.1 Analysis

The rhyme task in the second experiment yielded 252 valid responses as well as 12 invalid responses while the free task produced 257 valid responses with 7 invalid responses. The outputs offered by the informants were grouped into three distinct PoA for the rhyming onset, as earlier explained in (3). As shown in Table 2, the number in the parenthesis indicates the total number of rhyming singleton consonants according to the PoA. Of these valid responses, 13 responses indicate labial assimilation, 44 coronal assimilation and two dorsal assimilation in the rhyme task. Once again, the rarity of dorsal assimilation was noted, as uniquely generated in [gə.'ləʊ.kə.ləʊ] and [ˌkaɪ.'tʃu:t.gai.tʃu:t]. Why would this be the case, as we mentioned in 3.1.1?

Table 2: Instances of consonant harmony in terms of the PoA

Assimilation	Rhyme Task	Free Task
Labial	13 (94)	4 (26)
Coronal	44 (81)	27 (48)
Dorsal	2 (28)	0 (26)
Total	59 (203)	31 (100)

The free task yielded a smaller number of outputs exhibiting CH than the rhyme task did: Only four tokens of labial assimilation and 27 tokens of coronal assimilation were attested to. There was not any occurrence of dorsal assimilation between the base onset and the rhyming reduplicative onset. What occurred in the controlled experiment is that about 24 percent of the valid rhyming outputs provided supporting evidence for CH in the rhyme task whereas only 31 percent of the valid rhyming outputs in the free task yielded evidence for the target phenomenon.

For clarity, let us repeat the null hypothesis that the informants did not discriminate the labial consonant from the dorsal consonant in generating the rhyming reduplicant from the prepared base. The alternative hypothesis is that they discriminated the labial consonant from the dorsal consonant in generating the rhyming reduplicant from the nonce word. The chi-square test gives $\chi^2(1) = 0.32$ (n.s.) concerning the statistical difference between the labial base onset and the dorsal base onset. Note that there are only three prepared bases starting with labial singleton consonants: *fummage*, *vogen* and *pontay*. The chi-square test yields $\chi^2(1) = 1.71$ (n.s.) for the rhyme task regarding the statistical difference between the labial reduplicative consonant that rhymes with the base and the dorsal reduplicative consonant that creates rhyming with the base. Similarly, the chi-square test yields $\chi^2(1) = 2.88$ (n.s.) for the free task concerning the statistical difference between the labial rhyming reduplicative onset and the

dorsal rhyming reduplicative onset. Thus, it can be inferred that the informants did not discriminate the labial consonant from the dorsal consonant in generating the rhyming reduplicant in the tasks. The alternative hypothesis was thus rejected. A possible reason for this may have been the notable shortage of prepared bases starting with /b/ and /m/ which may have limited the productivity of labial rhyming consonants.

3.3 Dorsal Onset Avoidance

Dealing with a question with respect to the unproductivity of the dorsals' filling a euphonious reduplicative onset, we extrapolate in OT grammar that *[DORSAL], as defined in (6a), ranks above a constraint preserving the faithfulness of the primary PoA regarding the word-initial consonantal onsets of the two halves of the reduplicative words. In this regard, the IDENT-ONS[PLACE] constraint (Pater & Werle 2003) effectively helps explain and account for the preserving of the faithfulness of the primary PoA of the consonantal onsets. This constraint is defined below in (6b). Accordingly, we posit that the constraint argument as formulated in (7) may provide a viable solution to the question we encountered concerning the eschewal of a dorsal onset in the reduplicated form.

(6)a. *[DORSAL]: The word must not start with a dorsal consonant (Fikkert et al. 2005).

b. IDENT-ONS[PLACE]: "A consonant in onset position should be identical in [Place] specification to its correspondent" (Pater &

Werle 2003: 400).

(7) *[DORSAL » IDENT-ONS[PLACE]

Let us now consider the constraint interactions which are shown in Tableau 1. The pointing hands in the tableau indicate as possible viable outputs. As things stand, four output candidates from (a) to (d), i.e. any rhyming reduplicated outputs with the coronal or the labial onset, become possible inter-speaker variants in the rhyme task of the uncontrolled experiment. This speaks of how much variety the concept of euphony gives rise to, allowing many different consonants in the minds of the informants. As far as our research findings reveal the phonology of English, at least in the minds of the informants, the constraint interactions illustrated in Tableau 1 indicate “*the synchronic computational properties*” (emphasis is original) (Hale & Reiss 2008: 159) of various informants in the experiments. None of the informants but one produced candidate (e) as euphonic in the rhyming task. A natural question arises: What differentiates the rhyming reduplicant with a dorsal onset from those with a coronal or labial instead of the dorsal? It appears that the “auditory qualities” (Feist 2013: 107) which the onset clusters in [gɔ:p.kɔ:p] did not convey to a larger extent euphonic sounds to an auditory sense of the informants.

In OT grammar, violation of *[DORSAL dooms

candidate (e) to failure due to its markedness. The use of a coronal or a labial consonant in the rhyming reduplicative onset will incur violation of IDENT-ONS[PLACE] though such a violation is not relevant to the assessing of the optimality of the winners. At this juncture, it is worth mentioning that the phonology of real English reduplication contains the constraint ranking in (7), which explains and accounts for the non-existence of a real reduplicative word with the dorsal onset filling the initial onset of its base and reduplicant.

Let us next see what occurs in the reversal of the constraint hierarchy in (7), as formulated in (8). As shown in Tableau 2, the output candidate with the dorsal onset wins over those with the labial or coronal onsets under this constraint hierarchy. Section 3.1.1 notes that [gɔ:p.kɔ:p] was the only dorsal assimilation of *gaup* in terms of the PoA in the free task. It may be said that given the input /gɔ:p/, the grammar for most speakers disfavor dorsal assimilation as in Tableau 1, but the grammar for one speaker who generated [gɔ:p.kɔ:p] allows for dorsal assimilation as in Tableau 2. It is precisely where we can notice phonological variation among the speakers.

(8) IDENT-ONS[PLACE] » *[DORSAL

By quoting Lashley (1951)’s insights, Fromkin (1973: 17) considers a hierarchy of speech errors, “just as there is a hierarchy of stages in the speech

Tableau 1





Input /gɔ:p + RED/	*[DORSAL	IDENT-ONS[PLACE]
a.  gɔ:p.lɔ:p		*
b.  gɔ:p.rɔ:p		*
c.  gɔ:p.bɔ:p		*
d.  gɔ:p.ʃɔ:p		*
e. gɔ:p.kɔ:p	*!	

Tableau 2

Input /gɔ:p + RED/	IDENT-ONS[PLACE]	*[DORSAL]
a. gɔ:p.lɔ:p	*!	
b. gɔ:p.rɔ:p	*!	
c. gɔ:p gɔ:p.kɔ:p		*

process.” By analogy, there may be a hierarchy of consonantal assimilation in light of generating CH when nonexistent base and reduplicants are used. An analysis of the results at hand, as demonstrated in Tables 1 and 2, indicates *prima facie* evidence that coronals, labials, and dorsals do not stand an equal chance to fill the rhyming reduplicative onset in the experiments. If this is the case, it may not be too premature to suggest a putative hierarchy in which coronals tend to be preferred over labials in the synchronic generation of a euphonious rhyming reduplicant. The coronal assimilation in light of forming CH is considered default. The unmarked element is usually the most frequent one (Greenberg 1966; Bybee 2015). Further down the hierarchy, labials are favored over dorsals in such a reduplicative process. Dorsals lie at the bottom of the hierarchy, and thus most restricted in the rhyming consonantal assimilation. Running in parallel with our discussion here, Bybee (2001: 31) notes that the distribution of real words in native language speakers’ lexicon helps them judge “the relative acceptability of nonce” words with legal and illegal phonotactic patterns.

At this juncture, it may be worth suggesting that even if a smaller number of bases starting with a labial onset are used in the controlled experiment, the labial is still productively used to fill the rhyming onset of the reduplicant (see Table 2). Outnumbered by coronals and labials respectively, dorsals are the least favored among the consonants in the synchronic generation of a euphonious rhyming English reduplicant. It is understandable that coronals come across as default under the

universal ranking *LAB, *DOR » *COR (Lombardi 2001), where coronals are more unmarked than labials and dorsals in terms of the PoA (Minkova 2003). However, this universal constraint ranking alone does not explain why the labial onset filling the rhyming reduplicant is preferred over the dorsal onset serving the same role.

4. Summary and Conclusion

The present work began by casting some doubt upon the statement made in past studies to the extent that the evidence of CH is thin in the adult phonology of English (Fikkert et al. 2005), as Skaer (2005: 76) notes that by and large “a scientific statement must be *falsifiable*” (emphasis is original). He argues that the accuracy of a scientific statement needs to be scrutinized under all conditions in the natural world. In order to form a hypothesis regarding synchronic CH in English, the present study conducted the experiments wherein synchronic pieces of evidence were culled from the outputs produced by the informants. This study reaped the benefits of conducting the experiments, which show the exclusive availability of CH in terms of the PoA when a nonsensical euphonious reduplicant is generated by the informants in the two experiments. Statistically significant evidence supporting CH was obtained only when the rhyme task was conducted in the uncontrolled experiment. The availability of evidence supporting CH in the rhyme task could be construed as TETU because the free task in the uncontrolled experiment effectively blocked such an emergence of CH.

Additionally, the abessive nature of the dorsal consonantal onset in a euphonious rhyming reduplicant has been observed. This phenomenon may be ascribed to the activity of *[DORSAL dominating IDENT-ONS [PLACE] in the phonology of the informants (see Tableau 1). In order to validate the ubiquity of dorsal avoidance for a euphonious reduplicant, it will be necessary to conduct further studies in the similar vein but in other unrelated languages with productive partial reduplication. As earlier mentioned by Bybee (2001), such studies need to address both high-frequency and low-frequency onset consonants in rhyming reduplication in the target languages. If we observe the ubiquity of dorsal avoidance in these languages, then it can be hypothesized that dorsal onsets are shunned away from filling a euphonious rhyming onset cross-linguistically.

The present study might contain one potential limitation to the extent that there may be biases that the informants bring to the rhyme and free tasks from their own language use, or from their own experience in the language (McMullin 2013). As individual speakers' experience in language acquisition tremendously varies, as a result of which their knowledge internalized in the mind differs from one another (Honeybone 2011). By implication, having different informants participate in the experiment may yield results with varying nature.

References

- Bolinger, D. (1986). *Intonation and its Parts: Melody in spoken English*. Stanford, CA.: Stanford University Press.
- Brand, S. & Ernestus, M. (2018). Listeners' processing of a given reduced word pronunciation variant directly reflects their exposure to this variant: Evidence from native listeners and learners of French. *Quarterly Journal of Experimental Psychology* **71**, 1240-59.
- Bybee, J. L. (2001). *Phonology and Language Use*. Cambridge: Cambridge University Press.
- Bybee, J. L. (2015). *Language Change*. Cambridge: Cambridge University Press.
- Crosswhite, K. (1998). Segmental vs. prosodic correspondence in Chamorro. *Phonology* **15**(3), 281-316.
- Crystal, D. (2003). *The Cambridge Encyclopedia of the English Language*. 2nd ed. Cambridge: Cambridge University Press.
- Crystal, D. (2010). *The Cambridge Encyclopedia of the English Language*. 3rd ed. Cambridge: Cambridge University Press.
- Deville, G. (1891). Notes sur le développement du langage II. *Revue de Linguistique et de Philologie Comparée* **24**, 10-42, 128-43, 242-57, 300-20.
- Feist, J. (2013). Sound symbolism in English. *Journal of Pragmatics* **45**(1), 104-18.
- Fikkert, P., van Heugten, M., Offermans, P., and Zamuner T. S. (2005). Rhymes as a window into grammar. *Proceedings of the 29th Annual Boston University Conference on Language Development* **1**, 204-15. Somerville, MA.: Cascadilla Press.
- Fromkin, V. A. (1973). Introduction. In V. A. Fromkin (Ed.). *Speech Errors as Linguistic Evidence*. 11-45. The Hague: Mouton.
- Goad, H., and Buckley, M. (2006). Prosodic structure in child French: Evidence for the foot. *Catalan Journal of Linguistics* **5**, 109-42.
- Greenberg, J. H. (1966). *Language Universals: With special reference to feature hierarchies*. The Hague: Mouton.
- Hale, M., and Reiss, C. (2008). *The Phonological Enterprise*. Oxford: Oxford University Press.
- Hammond, M. (1999). *The Phonology of English*. Oxford: Oxford University Press.
- Honeybone, P. (2011). Variation and linguistic theory. In W. Maguire, and A. McMahon (Eds.). *Analyzing Variation in English*. 151-77. Cambridge: Cambridge University Press.
- Jespersen, O. (1942/1965). *A Modern English Grammar on Historical Principles VI: Morphology*. London: George Allen & Unwin.
- Johnson, B. (2019, July 24). *Boris Johnson: First speech as PM in full*. Retrieved from

- <https://www.bbc.com/news>
- Kobayashi, H. (2017_a). *Structural Regularities and Irregularities in English Reduplication in Relation to Hawaiian, German, Korean, and Ancient Greek Reduplication*. M.A. thesis. Hiroshima University.
- Kobayashi, H. (2017_b). Empirical evidence to consonant harmony in English reduplication. *Conference Handbook of the English Linguistic Society of Japan* **35**, 125-28.
- Kobayashi, H., and Skaer, P. M. (2018). English unmarked reduplicants in Optimality Theory: Ragtag, powwow and riff-raff. *Bulletin of the Graduate School of Integrated Arts and Sciences, Hiroshima University. I, Studies in Human Sciences* **13**, 1-21.
- Lashley, K. S. (1951). The problem of serial order in behavior. In L. A. Jeffress (Ed.). *Cerebral Mechanisms in Behavior: The Hixon Symposium*. 112-46. New York: Wiley.
- Lombardi, L. (2001). Why place and voice are different: Constraint-specific alternations in Optimality Theory. In L. Lombardi (Ed.). *Segmental Phonology in Optimality Theory: Constraints and representations*. 13-45. Cambridge: Cambridge University Press.
- McCarthy, J. J. (1982). Prosodic structure and expletive infixation. *Language* **58** (3), 574-90.
- McCarthy, J. J., and Prince, A. (1994). The emergence of the unmarked. *Optimality in prosodic morphology*. *Northeastern Linguistic Society* **24**, 333-79.
- McCarthy J.J., and Prince, A. (1995). Faithfulness and reduplicative identity. In J. Beckman, L.W. Dickey, and S. Urbanczyk (Eds.). *University of Massachusetts Occasional Papers in Linguistics* **18**, 249-384.
- McMullin, K. (2013). Learning consonant harmony in artificial languages. *Proceedings of the 2013 Annual Conference of the Canadian Linguistic Association*. 1-13.
- Minkova, D. (2002). Ablaut reduplication in English: The criss-crossing of prosody and verbal art. *English Language and Linguistics* **6**(1), 133-69.
- Minkova, D. (2003). *Alliteration and Sound Change in Early English*. Cambridge: Cambridge University Press.
- Pater, J. (1997). Minimal violation and phonological development. *Language Acquisition* **6**(3), 201-53.
- Pater, J., and Werle, A. (2003). Direction of assimilation in child consonant harmony. *Canadian Journal of Linguistics* **48**(3/4), 385-408.
- Pierrehumbert, J. (1994). Knowledge of variation. *Papers from the Parasession on Variation*. 30th Meeting of the Chicago Linguistic Society, 232-56.
- Prince, A., and Smolensky, P. (1993/2004). *Optimality Theory: Constraint interaction in Generative Grammar*. Malden, MA. & Oxford: Blackwell.
- Rose, Y. (2000). *Headedness and Prosodic Licensing in the L1 Acquisition of Phonology*. Doctoral dissertation, McGill University.
- Skaer, P. M. (2004). Language universals and child language acquisition. *Journal of Integrated School of Arts and Sciences of Hiroshima University* **30**, 83-109.
- Skaer, P. M. (2005). Evolution, structuralism and Chomsky: An Introduction to issues involving rules, constraints and Universal Grammar in modern generative phonology. *Journal of Integrated School of Arts and Sciences of Hiroshima University* **31**, 75-101.
- Wolfram, W., and Johnson, R. (1982). *Phonological Analysis: Focus on American English*. Englewood Cliffs, NJ.: Prentice Hall.
- Yip, M. (2001). Segmental unmarkedness versus input preservation in reduplication. In L. Lombardi (Ed.). *Segmental Phonology in Optimality Theory*. 206-28. Cambridge: Cambridge University Press.
- Zukoff, S. (2012). *The Phonology of Verbal Reduplication in Ancient Greek: An Optimality Theory approach*. M.A. thesis. The University of Georgia.
- Zwicky, A. M., and Pullum, G. K. (1987). Plain morphology and expressive morphology. *Proceedings of the Annual Meeting of the Berkeley* **13**, 330-40.

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Notes

- i The token *goddam* [ɡɒd.dæm] forms an exception to the general rule of English phonology, a rule which stipulates that identical consonants do not fill both the coda position and the immediately following onset position in the same word (Bybee 2001).
- ii These are only coincidentally “lexical”—their derived forms result in an existing form, but does not owe any allegiance to that existing form—even “tow” for example, is actually pronounced [tau] (as opposed to [to]), bearing little phonological, and no semantic, relationship to the “licensed” lexical form of the same spelling.