Elision of English Consonants
and
Its Phonological Rules
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by
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Preface

Most foreign learners of English feel great difficulty in identifying colloquial speech sounds. This must be due to the fact that the phonetic features of actual utterances spoken by native speakers are very variant, and the phonological system by which they encode or decode an utterance is different from that of foreign learners.

To improve the listening competence of foreign learners, some strategies have to be devised whereby their phonological system can be made the same as that of native speaker's. There is significance, therefore, in my attempt in this paper to illuminate the phonological system which dominates the phonetic variation of native speaker's utterance.

Thanks are due to all the teachers of this faculty for their many invaluable comments and suggestions. I especially owe thanks to Prof. Tange for his encouragement and helpful discussion, particularly the questions he has raised and the answers he has supplied or forced me to find.

Tadashi Takeshita

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Introduction

A speech sound shows great diversity in its phonetic features not only from one person to another, but also in the speech of one individual. Nevertheless the phonetic variation does not affect verbal communication. This seems to be because each individual shares common linguistic system, which might correspond to "langue" in Saussure's term, and every speech sound is articulated and varied within this linguistic system. That is, any phonetic variation, no matter whether it is interpersonal or intrapersonal, as far as it works as language, would appear to be governed by some rules which compose the linguistic system.

The aim of this paper is to clarify the phonological system by which one encodes or decodes the various forms of speech sounds. To accomplish this aim, what dominates the phonetic variation is mainly discussed with respect to consonant elision.

In chapter one it will be asserted that sound reduction is primarily derived from an underlying concept that the prior task in speech design is to make the most effective utterance. General phonological rules concerning consonant elision will be described in chapter two. In chapter three the eliding mechanisms of some sounds will be exemplified, which will implicitly specify that the phonological rules are closely related to the facility of articulatory motor
movement. Chapter four will be concerned with redundant features of speech sound. It will be claimed that a speaker's intuition of sound redundancy facilitates sound reduction.

We will see that phonetic variation in spoken English does not occur accidentally but is strictly regulated by a global phonological system composed of various factors, which would account for the fact that phonetic variation does not affect verbal communication.
CHAPTER I

Effective Utterance and Elision

Human speech act is generally admitted to aim at conveying a message. This primary aim is supposed to underlie every speech act. It can be assumed that, as C. Richards says, in articulating utterances "speakers are guided by the need to express meanings effectively." On this assumption, how that basic notion works on actual articulation to cause elision will be discussed in this chapter. Eventually it will be asserted that a sound is usually elided in three steps, which are organized hierarchically as shown in Figure 1.

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To begin with, let us see what is an "effective utterance": what defines the effectiveness of speech? This question seems to be answered by looking into the mechanism of the speech perception. Granting that the mechanism of listening comprehension is so complex and is still a controversial subject, we will discuss how a hearer understands the meaning of an utterance, from the following three points of view:

i) the inference from the context

ii) listening comprehension as a positive act

iii) patterns of word identification.

There have been provided a lot of claims and evidence which support the view that a hearer greatly depends on the context in interpreting utterances. Clark's following remark represents them:

Although normal conversational speech seems lucid and unexceptionable, it is in actuality quite unintelligible when taken word by word. This has been demonstrated by Pollack and Picket (1964).¹

Besides this kind of claims, the so-called "cocktail party phenomenon" will remind us how essential the context or coherence of meaning is in order to catch an utterance.

Listening comprehension used to be regarded as a passive act, but recently many linguists such as Slobin, Clark,

Lieberman (1967), Palmer (1936), etc., consider it as a positive act. That is, much of the speech people hear is not what a speaker has actually produced but what they have synthesized. Slobin exemplifies this notion as follows:

Apparently we do more than process acoustic signals in hearing. We try to make sense of what we hear, and this attempt actually modifies acoustic perception.

Warren and Warren (1970) have demonstrated that listeners even imagine sounds they have not heard, if such sounds are plausible in the context.

And they attribute the clarity of speech to this hearer's "self-generation."

In addition to the evidence provided above, more convincing data are presented by Takefuta, citing from Mehrabian. He says what might be conveyed only by lexical words shares seven percent of the whole information received by a hearer, and it will be increased up to 45 percent if the amount conveyed by the paralinguistic features is added.²

It is evident by now that a hearer does not depend on the sounds as such to understand the speech. But yet it is also true that listening comprehension will never arise without perceiving any sounds, namely the acoustic information

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is an essential clue which would become the very base of listening comprehension. Putting them together, we can assume that a hearer will intuitionally discriminate the acoustic information to be neglected from that to be appreciated as basic cues by which he interprets the utterance.

Presupposing that a message is primarily received by recognizing a set of words, the "effective utterance" can be defined as follows: some words of the utterance, which are supposed (by a speaker) to be unpredictable from the context, or to be crucial to the speaker's specific intention, are articulated so that the hearer can properly perceive them. It implies that at the moment of speech articulation one may intuitionally assign an order of importance to each component word with respect to conveying his intention most effectively. Let us call this speaker's intuitional act "word specification." Once we take a look into our own speech acts, this view would be confirmed by noticing that, as Noteboom says, "a speaker continuously adapts his speech to his estimates of what a listener needs at each point in the utterance."\(^1\) Such adaptation is equivalent to the word specification.

This word specification affects the articulation and is realized in the utterance. That is, the essential

words may be articulated carefully and precisely whereas the others sloppily. Lieberman's following remark supports this assumption:

The speaker, (in turn), simplifies his articulatory control problem, knowing when the listener probably will be able to guess what the message should have been. The speaker may neglect to manipulate his articulatory apparatus precisely when he believes that the listener will be able to guess what he should have said from the context of the message. Clark (1977) and Brown (1977) agree with Lieberman on this point.

It has become clear that the speaker's primary desire to express meaning effectively works on his articulation and eventually causes sound reduction. That is to say, the word specification is the first step to elision. It is well exemplified by the following case described by Jespersen:

When /r/ and unstressed /h/ come together, the latter disappears: it is good for him [its'gudfarhm] but if the h-word is stressed, [h] is kept: [its'gudfa'him]. It does not follow, however, that in order to make his utterance efficient a speaker articulates each phonetic constituent of an essential word precisely nor that he utterly blurs or omits those of unimportant words. Precise


pronunciation of each sound does not always result in the proper perception of the word. That is because words are not recognized by perceiving individual sounds but by specific acoustic cues integrated into a unit or pattern. We may call this unit "word identification pattern."

As Gimson, Nakatani & Schaffer (1978), Brown, and others admit, "a word has a characteristic accentual or rhythmic pattern for speaker and listener alike, which is as much a part of a word's identity as its sound sequence." And some evidence is presented to prove that "native speakers rely strongly on the stress pattern of a word in order to identify it." One of the evidence is the following little experiment of Togo's and its result:

When I said [mænɛrnoʊz], substituting all plosive consonants of potatoes in "Would you pass me the potatoes?" by /m/ and /n/, with a correct rhythm m□□ [here he means stress pattern by 'rhythm'], and another said [bədɛɪdouz] with □□□', potatoes were passed for both of us. When I said, however, in a proper pronunciation ([pə'teɪtɔʊz]) with improper rhythm □□□', I failed to be understood. (the writer's translation)

Adding to this, it is widely agreed that, as Clark says, "a major portion of the phonetic information in speech is

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carried by the stressed syllables [emphasis added]."\(^1\)

A hearer must identify a word depending mostly on a "stress pattern" and "stressed syllables," which may thus be the major components of the word identification pattern.

You will agree on this view seeing that you can easily predict the following words in parentheses given stress patterns and stressed syllables with some other fragments.

1. This is a very [\textipa{\textipa{pɔr}}] book.
2. Oh, that's [\textipa{\textipa{ɪntʃ} \textipa{æ}}].
3. Can you see an [\textipa{\textipa{æləf} \textipa{æ}}]?

This leads us to say that a speaker must focus his articulation on the stressed syllables especially of the crucial words in order to make his utterance the most efficient. Conversely, unstressed syllables tend to be neglected on their careful articulation. It follows then that sound reduction actually occurs on unstressed syllables. This is the way syllables are specified to involve elision. And it is the second step to elision following the word specification phase.

What is stated above does not imply, however, that sound reduction occurs in any unstressed syllables. Even if a given syllable is not stressed, the syllable may not lose any of its constituent sounds. It will lose some only when it is forced to by another factor.

\(^1\) Clark et al. (1977), p. 216.
Elision is facilitated to occur by rhythm. English has what is called stress-timed rhythm. Stressed syllables carried on the peaks of rhythm which happen at regular periods of time must be those of specific words which are defined as being essential to convey the message. The number of syllables with primary stress and their distribution in a sentence, however, differ from sentence to sentence. In order to follow the rhythm, the articulation is to be modified. Some syllables are to be articulated compressed and others rather lengthened. This compressing articulation forces some sounds to be assimilated, coalesced, or reduced. Unstressed syllables are thus led to be reduced by the physical constraints of rhythm.

In order that a given sound is finally chosen to be deleted, it must pass one more screening. Even in the compressed syllables, a sound to be omitted is not optional. It must be further specified by its sound circumstances (consonant sequence) involved. This issue will be dealt with in detail in later chapters by showing how a consonant sequence specifies a sound to be dropped.

Now let me conclude this discussion. When we construct a speech, we subconsciously (or consciously at some occasions) specify the crucial words of utterances, in terms of conveying his message efficiently. This specification tempts one to simplify the articulation of less crucial words. Here is an onset of sound reduction. And some sounds are finally chosen to be omitted going through
specifying phases concerning word identification patterns, rhythm, and sound environments.

It is remarkable that, as Noteboom claims below, elision contributes to the efficiency of utterance in another positive way:

Minimizing the time span needed for the articulation of coherent parts of linguistic messages may have the additional advantage that the time during which such a coherent part of a message must be kept in short-term storage is reduced, both for speaker and listener.

¹ Noteboom, (1983), p. 188.
CHAPTER II

Phonological Rules Concerning Elision of Consonants

The purpose of this chapter is to examine the actual data involving consonant elision, both presented by phoneticians and observed by myself, and to describe the characteristic relations between consonant sequences and elided sounds in the form of phonological rule.

What Daniel Jones says below represents the most phoneticians' view of elision:

Elision is defined as the disappearance of a sound. There are historical elisions, where a sound which existed in an earlier form of a word was omitted in a later form; and there are contextual elisions, in which a sound which exists in a word said by itself is dropped in a compound or in a connected phrase. [emphasis original]

In this paper, "historical elision" and "contextual elision" are used as having the same meaning as given by Jones above. Contextual elision is thus to be distinguished from the sound reduction often seen in some dialects, idiolects, or speech errors. It is defined as what happens in the normal informal, especially rapid speech.

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Historical Elision

Historical elision is mostly indicated by mutes. All mutes, however, do not prove that the sounds corresponding to them had been pronounced. There are some letters which were attached to the originals to indicate their origins (the language from which the words were borrowed), or added simply by an analogy. For example, gs of *feign* and *sign*, indicate these words originates in French, and l of *could* and s of *island* were mistakenly attached on the analogy of *should* or *would*, and *isle* respectively.\(^1\) They are excluded here.

The data of historical elision presented by Jones (1960), Jespersen (1983), Gimson (1980), O'Connor (1980), Yasui (1955), and Ohnishi (1960) are classified with respect to the elided consonants and their sound environments. They are shown in Table 1 below.

There are some disagreements among the data presented by the phoneticians above: some provide a certain word as a case of historical elision and others as contextual elision. For example, Jones says "The usual pronunciation of . . . kindness /kainnis/ shows historical elision of /d/, if, as is possible, /d/ was formerly sounded in these words,"\(^2\) whereas O'Connor, Gimson, and Yasui admit that both forms,

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<thead>
<tr>
<th>position elided round</th>
<th>Initial</th>
<th>Medial</th>
<th>Final</th>
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<tbody>
<tr>
<td>/t/</td>
<td>/s (m)</td>
<td>e.g.</td>
<td></td>
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<td></td>
<td>/f - (m)</td>
<td>castle</td>
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<td>listen</td>
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<td>/d/</td>
<td>/n_C/</td>
<td>handkerchief</td>
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<td>psalm</td>
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<td>/_r/</td>
<td>write</td>
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<td>/C_C/</td>
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<td>/C -V/</td>
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<td>halfpenny</td>
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<td>/h/</td>
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<td>/C -V/</td>
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<tr>
<td>/l/</td>
<td>/l:/C/</td>
<td>/l:/C/</td>
<td>(*/k/ or labial consonant)</td>
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<td>/l:/C/</td>
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<td>/l:/C/</td>
<td>/l:/C/</td>
<td>should, would</td>
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<tr>
<td>/r/</td>
<td>/V_C/</td>
<td>forecastle</td>
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<td></td>
<td>Worcester</td>
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[kəɪndnɪs] and [kəɪnɪs], are heard and we can use whichever we find easiest. As for often, Gimson says /t/ of often has been dropped, although O'Connor asserts [ðəfn] and [ðfn] are now used.¹ I also hear some English native speakers say [kəɪndnɪs] or [ðəfn] and others say [kəɪnɪs] or [ðfn]. Some dictionaries also admit the both forms.²

More disagreements of this kind are readily found. These disagreements may come from the differences in the English they analysed and in the criteria they used to establish a certain elision. Such disagreements, however, can be neglected here, because what we are concerned with is not whether a certain sound in some word should be classified as historical elision or contextual elision but what sound environments generally affect specific sounds to be reduced.

The following are the rules generated from the data.

RULE 1. In word initial consonant cluster of plosive (/p, k, g/) + consonant (except /l, r, w, j/), the plosives were historically elided.

RULE 2. In word initial /wr-/ /w/ were elided.

RULE 3. In word final /-mb/, /-mn/, /-ln/, and /-g/ /b/, /n/, and /g/ were elided respectively.


² Webster's Third New International Dictionary admits both forms of kindness and often. O.E.D. admits both forms of often, but not kindness.
There are a few exceptions to RULE 1 and 3, which are all borrowed words or highly technical words.¹

RULE 1 presupposes that /l, r, w, j/ are consonants, though whether these sounds are to be defined as consonants or vowels is still a controversial subject among phoneticians. Since it is not likely to be so much relevant to the discussion here, we will pass over this problem, but such distinctive features of these sounds which cause disagreement among some phoneticians in classifying them as consonants seem to be relevant to the fact that only these sounds can follow plosives in word initial position without eliding the plosives.

/w/ concerning RULE 2 has a specific feature of glide, and the consonant clusters concerning RULE 3 consist of homorganic sounds or sounds of the same types of productive mechanism. Thereby we can assume that some specific features of a given consonant sequence affects a certain sound to be elided. In other words, the omission of certain sounds is never arbitrary nor accidental, but closely related to the sound environments involved.

As for historical elision of word medial consonant, the sound environments of them are similar to those of

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¹ e.g. kvass /kvaːs/: a lightly alcoholic drink in Eastern Europe and Russia,

jamb /aɪm, aɪməb/: a measure of poetry consisting of one weak beat followed by one strong beat.
contextual elision. It will be analysed in connection with contextual elision in the following section.

Contextual Elision

Contextual elision is roughly divided into two classes, word internal elision and one which takes place at the vicinity of word boundaries in connected speech. Both of them are analysed and described with respect to the sound sequence. Although the description again takes a form of phonological rule, it is unfortunately a "tendency" statement. The "RULE" does not mean that a given sound in such and such an environment will be always omitted but that if the sound is reduced it occurs in the specific environments described in the RULE.

Observing colloquial speech, we easily find how often /t/ and /d/ are elided, and it is generally admitted that these sounds are the most common consonants involved in contextual elision. Brown says "it is more common for /t/ and /d/ to be elided between consonants than it is for them to be pronounced."¹ O'Connor is more radical saying "when /t/ or /d/ occur between two other stop consonants they are never heard and you should leave them out."² Although Brown admits

a difference between /t/ and /d/ in that "/d/ is elided even more readily than /t/ and in more environments,"¹ /t/ and /d/ are not described separately here as a rule.

RULE 4. /t, d/ between consonants are most readily elided within a word,
   e.g. exactly, mostly, handbag, friendship, windmill, softness.
As the examples above show, there seems to be no need to specify the consonants in the rule, but Heffner gives a specification for them:

There is a tendency for [d] to be completely assimilated, or lost, between /n/ and a following [l] or [r] in words like kindling, swindler, laundry, hundred, handle.

Does he thereby mean the sequence /ndl/ or /ndr/ make /d/ omitted "more" readily than any other sequence? If he does, the distinctive features of these consonant sequences should be clarified. But unfortunately he fails to do so.

RULE 4.1. In the sequence /skt/, /k/ rather than /t/ is often elided.
   e.g. risked prison, asked them.
   [ristprizn]   [æstʒm]

RULE 5. Word final /t/ or /d/ is readily elided in the sequence of consonant + {/t/ followed by a word with an initial consonant.

Gimson defines the consonant in RULE 5 as "continuant consonant, plosive, and affricate," and presents examples including /n/.

He explicitly defines a nasal as a "continuant" saying that "Since the air-stream may escape freely through the nose, nasal consonants are continuants." His definition is not consistent with that of Chomsky & Halle who assign nasal consonants a distinctive feature of [-continuant] proclaiming that "in the production of continuant sounds, the primary constriction in the vowel tract is not narrowed to the point where the air flow past the constriction is blocked." The definition of continuant is likely to bring about another problem, but the issue is not relevant here, and we will not discuss it further. Moreover, as far as RULE 5 is concerned, it is not necessary to specify the consonants as Gimson does, because the excluded consonants, i.e. /w, j/, rarely precede /t/ or /d/ in word final position except in the inflectional or derivational forms.

Therefore, "consonant" must be a satisfactory description

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in RULE 5.

The followings are the examples of RULE 5.
/-st/: next day, raced back, last chance, first light,
/-ft/: left turn, soft centres, left wheel, drift by,
/-ft/: mashed potatoes, finished now, pushed them,
/-nd/: bend back, tinned meat, lend-lease, found five,
/-ld/: hold tight, old man, cold lunch, bold face,
/-zd/: refused both, gazed past, caused losses, raised gently
/-jd/: loathed beer,
/-vd/: moved back, loved flowers, saved runs, served sherry,
/-pt/: kept quiet, helped me, stopped speaking, jumped well,
/-kt/: liked jam, thanked me, looked like,
/-tjt/: reached Paris, fetched me, parched throat,
/-bd/: robbed both, rubbed gently, grabbed them,
/-gd/: lagged behind, dragged down, begged one,
/-d3d/: changed colour, urged them, arranged roses.¹

RULE 5 can be further specified as having its sub-rules below.

RULE 5.1. /t/ in the sequence \(/[^fS]t/\)+ /t/ is most readily elided,

e.g. next month, left there.

Some words containing this sequence lost /t/ as historical

¹ The examples provided here are mostly those presented by Gimson in A. C. Gimson, (1980), p. 293.
elision, e.g. castle, listen, hasten.

RULE 5.2. /d/ in the sequence /-nd/ and /-ld/ is apt to be elided,
e.g. grand view, old time.

Like the case of RULE 5.1, the sequence /nd/ in a word often makes a historical elision, e.g. handkerchief, (handsome). Ohnishi says that /d/ in /-nd/ or /-ld/ is often elided when it is followed by vowels [ɪ], [ə], and [ʊ] as well as consonants, providing the following examples, hold on, lend a car, find it. Yasui specifies the initial consonant of the word which follows the consonant cluster /nd/ or /ld/ as "other than /h, l, r, w, hw, [j]/." He says "/d/s in the phrases like gold ring and gold leaf are pronounced because of the following /r/ and /l/.

As for /h/, one of the excluded consonants above, Yasui's assertion is compatible with RULE 5.4 below. And the characteristic features of the other excluded consonants (/l/ and /r/ are assigned [+vocalic], and /w/ and /j/ are glides), would support Yasui's view if it could be proved that their special features work not to

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2 M. Yasui, (1955), pp. 42-43. He represents /j/ by /y/.

3 Chomsky & Halle, (1968), pp. 176-77.
reduce the preceding /d/.

Unlike /d/ described in RULE 5.2, /t/ which is the same as /d/ in terms of alveolar-plosive, is retained in the sequence /-nt/ or /-lt/. Gimson says:

Final sequence /-nt, -lt/ tend to keep either /t/ or [2], the appropriate reduction of preceding sounds being retained as a result of the final fortis plosive, e.g. in sent back, count them, felt bad, built near.

Nevertheless, Gimson as well as any other phoneticians admits that in the case of the negative /-nt/, /t/ is often elided as is described in RULE 5.3 below. Is there any difference between the sequence /-nt/ in negatives and the /-nt/ in other items? This issue will be discussed in connection with the process of articulation in the next chapter.

RULE 5.3. The /t/ of the negative /-nt/ is often elided, particularly in disyllables, before a following consonant,

e.g. You mustn't lose it. Doesn't she know?

[mʌsŋ] [dʌzŋ]

A condition involved in RULE 5 and its sub-rules (i.e. the sound in question is followed by a word initial consonant) must imply that when the sound is followed by a vowel, the /t, d/ are kept or at least less frequently elided.

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2 That syllabic consonant makes one syllable is postulated here.
This is explicitly stated by O'Connor, Heffner, and Brown. For example, O'Connor says that last in last out is said /laːst/, and in last man /laːs/.\(^1\)

The following two sub-rules of RULE 5 show the cases where /t, d/ are rather preserved.

RULE 5.4. Final /t, d/ followed by a word beginning with /h/ are usually kept,
e.g. kept hold, worked hard, round here.

RULE 5.5. Final /t, d/ followed by a word beginning with /j/ are usually kept in a coalesced form with /j/, i.e. /tʃ/ or /dʒ/,
e.g. helped you, liked you, lend you, told you.

RULE 6. /h/ in pronominal weak form is often lost.

RULE 7. [ɨ] is apt to be lost when preceded by [],
e.g. always, already, all right.
Folk, walk, chalk, etc., have lost [ɨ] as historical elision.

RULE 8. When /v/ is the final consonant in an unstressed function word immediately preceding another consonant, it is often elided,
e.g. of course, we've been considering.
[əˈkɔːs]    [wɪˈbɪʒ]

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Though it is rare, final /v/ in content word is also elided as Brown observes in those cases:

five p.m. news, children leave school.¹

['faɪ pi'ɛmŋjuːz] ['tʃɪldrən'liː'skʊl]

RULE 9. A word containing two /r/s internally is apt to lose one /r/,

e.g. library, proportion.

[lʌbərɪ] [pə'pɔːrʃən]

The omission of /r/ may result in the elision of whole syllable /rə/ in rapid speech. And it is especially the case where there is a sequence of /r/ sounds, e.g. library [lʌbərɪ], February ['fɛbri].

The RULEs presented so far are the cases which occur quite frequently. If we admit what Brown says: "It is clearly possible for any consonant to be elided in certain circumstances,"² and that its occurrence is governed by some phonological rule, a rule on each consonant elision could be described. Here, however, I should stop presenting phonological rules, because it is rather unreasonable to generate further rules from a few data obtained to analyze.

The following are the instances observed as the elision of other consonants.

Omission of /k/, e.g. succinct [sə'sɪŋkt], excursion [ɪ'skəʃən], expected [ɪs'pektɪd], accessory [ə'sesərɪ].

Omission of /g/, e.g. recognize ['rəkənəiz], language ['lægwidʒ].

Omission of /ʒ/, e.g. clothes [kləz],
went the way ['wentə'weɪ].

As we have seen so far, the sound environment of a given elided sound, no matter whether it is of historical elision or contextual elision, is almost identical, and can be described by a single rule. This leads us to an assumption that a given sound environment which has its own series of articulation and acoustic features would inherently define a sound to be omitted.

To justify the assumption, we look into the process of articulation and acoustic features of the consonant sequences concerning the RULEs and see how they necessarily promote a specific sound to be elided in the next chapter.

\[1\] Brown says that the form of the definite article is realized as [ə] in the case where the definiteness of the noun is clearly established and phonetic [ə] can only be interpreted as realizing the form /ə/, in G. Brown, (1977), p. 64.
CHAPTER III

Mechanism of Elision

In chapter one we saw a global mechanism of sound reduction. The first two steps of the eliding process were exemplified there. In this chapter we will see the mechanism of the last step: Why and how a certain consonant sequence specifies phoneme or syllable to be elided, by analyzing the articulatory motor movement and acoustic features.

A phoneme may be omitted partly or completely. Elision is defined here as "no articulation of phonetic features which make one identify the sound." That is, if we can recognize a sound by some acoustic cues, we count it as the sound being articulated irrespective of whether the normal articulatory process is followed fully or not. For example, a plosive has normally three stages in its articulation, "closure," "hold (compression)," and "release." But a plosive is usually recognized by either its aspiration or its closure according to its position in a word or syllable. A plosive without its "release," therefore, can be considered as being satisfactorily articulated on some occasions.

We will examine each case of elision in detail below.

3.01 Why are the alveolar-plosives /t, d/ most readily elided? (RULE 4-5)
A plosive (stop) is, as was mentioned above, formally articulated in three steps. A word final or medial plosive, however, does not usually have "release," and such plosives are perceived or recognized by some "silence" entailed by the "closure" and "hold." Therefore, as M. Halle et al. say, "if the 'silence' is filled by any other type of sound except voicing, a stop is not perceived." In other words, in the case where the speech organs begin to set up the form of the following sound before the silence is held long enough for one to perceive a plosive, the plosive would be felt as omitted.

In articulating affricates, fricatives, or nasals, the articulatory motors are necessarily fixed in an appropriate form for some time, whereas in the case of plosives, the place of articulation can be substituted or canceled during the compression phase by a shift of the articulation-point. For example, the closure by lips can occur when or after another closure is made between the tip (and rims) of the tongue and the alveolar (ridge). That is to say, the silence entailed by the compression which works as a clue for the recognition of plosives can be readily reduced or abandoned. This is the main reason why a plosive is often elided.

The fact that of all the plosives /t, d/ are most frequently omitted can be attributed to the characteristics of their

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place of articulation (the alveolar). Tazaki explains the shift of the articulation-point which results in some assimilation:

In pronouncing two successive plosives which would not be essentially homorganic, the articulation point of the former unstressed plosive would often be substituted by (or shift to) the latter's. Such shift of articulation-point occurs only from alveolar to bilabial or to soft-palate, not in other ways, i.e. not from bilabial to alveolar nor to soft-palate. For example, in good boy, /d/ of good is assimilated to /b/ of boy and it results in /gub bɔː/, whose /bb/ may be further reduced to /b/. On the contrary, a deep tank would not be pronounced */diːt tæŋk/ since /p/ of deep is not assimilated to /t/ in tank. (the writer's translation)

Similarly Gimson admits this feature of alveolar-plosives saying that "The alveolar stop contact is particularly sensitive to the influence of the place of articulation of a following consonant."²

The reason why /t, d/ are the most readily elided is, in short, that the silence (one of the acoustic cues for recognition of plosives) is easily abandoned and that alveolar (the position of tongue contact) is sensitive and well assimilated to others.

3.02 Elision of /t, d/ between consonants (RULE 4)

As I have repeatedly mentioned, /t, d/ are often omitted

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especially between consonants. Taking up the consonant cluster /ndl/, Heffner explains the process of /d/- omission below:

The oral occlusion for (n) [sic] and [l] are made in the same general region and so, when they fuse, the stop once set up for the nasal is not shifted until the lateral release of [l] is made. If the velum is raised before this lateral release of [l] begins, a [d] will be heard. When the raising of the velum comes after or simultaneously with the lateral release, the stop [d] will be assimilated completely with the nasal. (The result will not be a double nasal in such cases, but it may be a long [n:].)

3.03 Elision of /k/ in the sequence of /skt/ (RULE 4.1)

Formal pronunciation of the sequence /skt/ will follow this process: after making a fricative /s/ at the alveolar, a closure occurs at the soft palate for /k/, and then the point of articulation shifts back to the alveolar and the air is released there. /k/ and /t/ will be recognized by closure at the soft palate and air-release at the alveolar respectively. In a rapid or sloppy speech, however, the point of articulation may shift back to the alveolar without making complete closure at the soft palate for /k/, or the tip of the tongue might stay at the alveolar to economize the effort of shuttling between the alveolar and the soft palate. In any case, the closure at the soft palate is made incompletely or omitted, which results in the elision of /k/, not /t/.

3.04 Elision of /t/ in word final /st/ and /ft/ followed by a consonant (RULE 5.1)

In careful pronunciation of last man, for example, after the pronunciation of the fricative /s/, the closure at the alveolar for /t/ is made and /t/ is perceived by the silence entailed by the closure. Then it must be heard as /la:st/. On the other hand, /t/ would not be recognized if the bilabial closure for the subsequent /m/ occurs right after or simultaneously with the closure at the alveolar for /t/. Especially when /t/ is preceded by continuant consonants as /s/ or /f/, the closure at the alveolar has to be made fully enough to make the silence distinctive, otherwise the plosives would hardly be identified. This may well explain why /t/ following /s/ or /f/ is more readily elided.

3.05 Elision of /d/ in word final /nd/ (RULE 5.2-3)

In the case of bend back, for example, /d/ would be heard if the velum is raised (after making /n/) and the air stream is still blocked at the alveolar. On the contrary, if the bilabial closure for subsequent /b/ occurs as soon as the velum is raised for /d/, the closure at the alveolar would be concealed by the bilabial closure, which leads to the omission of /d/.

The fact that /t/ in /-nt/ is apt to be retained unlike /d/ in /-nd/ is attributed to a specific feature of /t/: "fortis" which inherently reduces its preceding sound. That
is, the presence of /t/ would be felt by the reduced preceding sound. Therefore, /t/ following /n/ is (felt as) omitted less frequently than /d/ in the same circumstances. Incidentally this partly justifies Brown's assertion given before: /d/ is more readily elided than /t/.

This explanation is likely to mislead us to infer that /t/ in the negative /-nt/ must also be retained and it seems to contradict RULE 5.3. This inference, however, is easily proven to be wrong if only we recall that RULE 5.3 is mainly concerned with the negatives of disyllable. As far as the negatives of monosyllable like won't and don't are concerned, as Gimson admits, the elision of /t/ is less common.¹ Then, why /t/ of the disyllable negative is elided more often than that of the monosyllable? In the case of mustn't, for example, most air is consumed (released) to produce the first stressed syllable /mʌs/ and the subsequent syllabic consonant /n/, and there remains almost no air to be constricted and to make one identify a plosive /t/. Therefore, a plosive can be rarely perceived even if the speech organs are organized in an appropriate form. But it is not the case, of course, if it is pronounced with two chest pulses, which is irrelevant here since it usually occurs in careful pronunciation.

3.06 Why do /t, d/ followed by /h/ or vowels tend to be

preserved? (RULE 5.4)

Let us compare last man and last out. In the case of last man, as was explained in 3.04, the reduction of /t/ is subject to the timing when the place of articulation shifts from the alveolar to that of the following sound (bilabial for /m/ in this case). In the case of last out /laːstaut/, on the other hand, the sequence /ta/ needs no shift of the articulation-point since vowels do not need constriction in oral cavity but require the oral cavity to be opened, which would incidentally elicit /t/ to be released. Thus, /t/ followed by a vowel would not be omitted but pronounced even with some aspiration.

/h/ also needs no narrowing in oral cavity, and it is pronounced by the air expelled from the lungs with considerable pressure. Then /t/ preceding /h/ would be uttered with aspiration conjoined with the onset of /h/.

3.07 Why are /t, d/ followed by /j/ kept in coalesced forms with /j/, i.e. /tʃ/, or /dʒ/? (RULE 5.5)

This is well explained by Tazaki below:

/tʃ/ and /dʒ/ need less movement of the articulatory motors and are easier to be pronounced [compared with /tʃ/ and /dʒ/]. In the cases of /tʃ/ and /dʒ/, the places of articulation have to move from /t/ or /d/ to /j/, whereas there needs no shift in /tʃ/ and /dʒ/, which apparently contribute to "facility of movement" and "economy of effort." (the writer's translation)

3.08 Why is /h/ in pronominal weak forms often elided?

As was mentioned in 3.06, /h/ is pronounced with expelling compressed air. If we admit that being unstressed is not compatible with expelling compressed air, we can simply acknowledge that pronominal weak forms can not maintain /h/.

Elision of /h/ in unaccented h-syllable (not necessarily of pronominal weak forms but of content words) is well shown in the following fact remarked by Gimson:

Some RP speakers treat an unaccented h-syllable, as in historical, as if it belonged to the special group hour, honest, etc., i.e., without an initial /h/, e.g. an historical novel.

3.09 Why is [ɬ] preceded by /ɔ:/ often elided? (RULE 7)

The following two features of [ɬ] seem to provide a satisfactory answer to this question. One is its characteristic resonance, similar to "back vowel resonance," which is heard in /ɔ:/ . The other is that the lip position of [ɬ] is readily affected by the adjacent vowel. these make it hard for one to distinguish [ɬ] from /ɔ:/.

3.10 Why are plosives in word initial sequence of plosive (/p, k, g/) + consonant, historically elided? (RULE 1)

Syllable or word initial plosive is usually aspirated. It implies that the air is almost consumed in producing the initial plosive. Then, if the plosive was uttered, there

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needs another chest pulse to articulate the subsequent consonant. Admitting that the articulation with two chest pulses is against the principle of "economy of effort," it is reasonable that one omits the initial plosive if he thinks the omission will not do any harm to communication.

Unlike the other consonants, /l, r/ can support the articulation of plosives in such an environment since plosives can be released at the articulation-point of /l, r/. /w, j/ can also support the articulation of such plosives because they are "glides" which are usually produced as a transition from its preceding sound to the following vowel. In this case, /w, j/ are identified by a transference from the plosive to the subsequent vowel. These syllables can thus be articulated with one chest pulse, and the plosives preceding /l, r, w, j/ need not be elided.

3.11 Why is /w/ in word initial sequence /wr-/ historically elided? (RULE 2)

If we admit that /w/ can occur only before vowels, as it actually does, because of its feature described right above, we can simply understand why /w/ before a consonant (/r/ in this case) is hardly articulated. But it fails to account for the fact /w/ before /r/ "was" pronounced until around the middle of the 17th c.¹ So, another reason should

be supplied for the reduction of /w/ before /r/, but I have not succeeded in it. What is clear at present is that as Jespersen says, the reduction "is due to the difficulty of uniting /w/ and /r/ in one syllable."\(^1\)

3.12 Why are /b, n, g/ in word final sequences /-mb/, /-mn/, /-ln/, /-gg/ historically elided? (RULE 3)

Notice that each sequence consists of the sounds which are homorganic or the sounds articulated in the same manner. In order to make one of them distinct from the other in such sequences, each sound must be articulated properly enough, because, as Pike says, "the more two sounds resemble one another and the closer their points of articulation and types of productive mechanism, the more difficult they are to tell apart."\(^2\) Furthermore, these sequences need two chest pulses to articulate properly. Since the air would be mostly released in producing /m/, /l/, or /ŋ/, the syllable final /b/, /n/, or /g/ could be uttered only with another chest pulse. Therefore, as Yasui says, to economize the effort, velum might stay lowered after saying /m/ or /ŋ/ in the cases of /-mb/, /-mn/, and /-gg/, or velum might stay raised after saying /l/ in the case of /-ln/,\(^3\) which naturally results in the reduction of the final consonants /b, n, g/.

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Mechanisms of consonant elision have been clarified in terms of articulatory process and acoustic features. It has been proved that the sound environments described in RULEs in chapter two have intrinsic reasons for promoting the elision of specific sound(s). This means elision is strictly regulated by the phonological rules of sound environments.
CHAPTER IV

Sound Redundancy

It has been claimed that comprehension of an utterance depends not only on each speech sound but also on its context. That one can understand the meaning of an utterance irrespective of its accurate or inaccurate articulation implies that he internally retrieves each constituent of the utterance by putting the given sound signals and the context together. The fact that even though the context is well known we often misunderstand or fail to catch utterances indicates that what we can infer from context is finite and that we retrieve sound(s) to some extent only by given acoustic cues.

Those retrieving act seems to owe to the hearer's knowledge about the phonological rules (the rules concerning elision are involved here). Besides such phonological rules, what helps one to restore the elided sounds will be discussed in this chapter with respect to acoustic features and redundancy of sound.

Even if a sound is elided, there often appear or remain some phonetic features which may enable a hearer to infer the reduced sound. These phonetic features can be called "phonetic redundancy," which seems to be equivalent to "[phonetic] redundant feature" in Ohta's term, and to
Takefuta's "complementary information." The following are some of the details of the phonetic redundancy.

4.1 Double Duration

The consonant clusters consisting of the same two consonants, /tt/ in what time, for example, is not usually pronounced as the double articulation of /t/. That is, it is not articulated by repeating the series of "closure," "hold," and "release," twice, but by synthesizing the two cycles into a single one: the "hold" of the former /t/ is fused with the "hold" of the latter, omitting the "release" of the first /t/ and the "closure" of the last. It may be regarded as an omission of /t/. This account, however, is apparently unrealistic since no one would recognize it as a single /t/. The reason why one recognizes it as /tt/ is due not only to its incompatibility with the syntax, but also to its specific phonetic feature. As illustrated in Figure 2, the duration of "hold" in the synthesized /t/ is usually longer, almost twice as long as single /t/’s.

![Figure 2 SYNTHESIS OF /t/](image)

Note: 1 closure
2 hold
3 release

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This characteristic duration of "hold" must make one identify it as double /t/. Tazaki (1978), Heffner (1950), O'Connor (1980), and Gimson (1980) admit that the same holds for the other consonant clusters.

4.2 Lengthening the Preceding Vowel

When a syllable is elided, the preceding vowel is lengthened. Brown's following description is supporting:

One might suggest that the length of time taken to pronounce the stressed syllable + lengthened vowel is about equivalent to that taken for the pronunciation of the stressed syllable + unstressed syllable /rə/ [in the following examples], e.g. environment /'rərərvəment/-[-rətərəvəment], European /'jʊərə'piən/ -[-'jaː 'piən].

Similarly when /v/ is elided, the preceding vowel is lengthened. See the examples 1 and 2 below. It is noticeable that when /v/ of an unstressed function word like of and have immediately preceding another consonant is elided, the prolongation of the preceding vowel does not occur. See the examples 3 and 4.

Examples,

1. children leave school /'tʃildrən'liːv'skʊ:l/ ['tʃildrən'liːv'skʊ:l]

2. five p.m. news /'feɪv'pi'em'njuːz/ ['feɪv'pi'em'njuːz]

3. of course /əv'kɔs/ [ə 'kɔs]

4. we've been considering /wibrinkan'sidarig/
    [wibrigkan'sidarig]

This difference between content words and function words reminds us how much the speech construction is affected by the primary notion of "making an utterance effective," i.e. the speaker's intuition that the function words are not so crucial in conveying his message as the content words.

4.3 A Case Where the Same Phonetic Feature of a Vowel Is Retained, Irrespective of Whether the Following Consonant Is Elided or not

Even though a consonant is elided, the preceding sound sometimes retains the same phonetic features as before.

The following details described by Brown provides a satisfactory explanation:

In examples [Ireland troubles, hurled twenty], where /d/ is elided before a /t/ it should not be supposed that the vowels in the preceding syllables shorten, in the way that they would be short and followed by a glottal stop before a final /t/. The vowel and /n/ . . . and the /l/ . . . retain the length that they would have had before /d/.

Even though no /l/ was pronounced, the preceding vowel still had the 'dark' resonance associated with syllable final /l/, so we find the same sort of thing with the elision of /n/. When /n/ is elided and adjacent vowel is likely to be nasalized as an individual segment it nonetheless leaves its traces in the word, . . . e.g., one wants to make [wʌn'wentstə'meɪk]→[wʌn'wʊstə'meɪk].

1 The examples provided here are all quoted from G. Brown, (1977), p. 63.
Further observation will reveal more details of phonetic redundancy. Those presented so far, however, must be sufficient to show that speech sound has various phonetic redundancy whereby one may retrieve the elided sounds. Granting this, however, one might suspect that hearers are so sensitive that they could actually recognize such subtle phonetic features. Some phoneticians have proved that native speakers are sensitive enough to perceive them. For example, Gimson clarifies that "Unreleased final bilabial, alveolar, and velar plosives . . . are distinguished mainly by the transitional features of the preceding sound."\textsuperscript{1} Takefuta presents the result of Shimizu's experiment which shows "the sensitivity to the trivial difference of aspiration helps one to discriminate . . . \textit{gray tape} from \textit{great ape}. [the writer's translation]\textsuperscript{2}

It is evident that phonetic redundancy contributes to one's retrieval of elided sound(s). We can also assert, conversely, that sound reduction is promoted by the speaker's intuition that the listener will retrieve the elided sound by such phonetic redundancy.

4.4 Phonemic Redundancy

Some words contain specific sounds (phonemes) which

\begin{itemize}
  \item \textsuperscript{1} A. C. Gimson, (1980), p. 158.
  \item \textsuperscript{2} Y. Takefuta, (1984), p. 75.
\end{itemize}
are redundant in terms of the words' identification. That is, reduction of these specific phonemes does not make the words homonyms of other words. For example, hearing /'ɪnərɪstɪŋ/, one will not fail to recognize it as interesting because he knows there are no other words pronounced /'ɪnərɪstɪŋ/ except the reduced form of interesting. /t/ of interesting is redundant for the word's identity. This feature of phoneme may be called "phonemic redundancy." Besides the phonetic redundancy, this phonemic redundancy is likely to affect sound reduction.

There is some evidence which supports my assumption that a speaker's intuition of this phonemic redundancy promotes sound reduction. The first evidence is the fact that the word final consonants are much more subject to contextual elision than the word initial consonants, as was shown in chapter two. If we presuppose that reduction of the word final consonants do not make homonyms and thus they are redundant, it may be reasonable that one may omit the final consonants to make effective utterances with the least efforts.

The following fact justifies the presupposition that reduction of the word final consonants makes few homonyms. There are only 432 words (in total out of 55,000 words) which, if their final consonants are omitted, will become homonyms of other words, for example, fun vs. fund, deaf vs. deft, saw vs. sauce, shoe vs. shoot, sell vs. self, win vs. wind,
tea vs. team. As these examples show, the opposing words would no longer be in opposition if they are given their syntax or context. On the other hand, there are many words which, if their initial consonants are reduced, will become homonyms of other words, for example, play vs. lay, take vs. ache, nice vs. ice, bring vs. ring, etc. A speaker may have an intuition of this fact that reduction of final consonants affects the words' identification much less than reduction of initial consonants, and this leads him to neglect articulation of these final consonants. It follows then that word final consonants are often omitted.

The second evidence is that the assumption presented right above can supply the most satisfactory reason for the fact that some sounds were completely omitted as historical elision. A common features shared by the consonant clusters producing historical elision is that they are relatively hard to pronounce and/or identify. This feature, however, is not unique for them but shared by the consonant clusters producing contextual elision. Therefore, the difficulty of pronunciation or identification cannot be the crucial reason in producing historical elision. Narita agrees on this view. He says:

The consonant cluster /ps/ is not excluded by the

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1 The words counted here are those entered in Longman Dictionary of Contemporary English (1978). There are 1472 words whose final consonants are the only distinctive sounds in a certain groups of words, for example, cheap, chief, cheek, and cheese can be distinguished from the others only by their final consonants. The 432 words are included in these 1472 words.
There must be other distinctive features of the syllables producing historical elision. Narita and Yasui attribute this tendency (to eliminate /p/ from /ps/, for example) to the "convention" or "naturalness" of the English sound. But no matter how the consonant sequence /ps/ was against the convention or naturalness, /p/ in /ps/ would not have been omitted if this omission had made it difficult to identify the words involved. Presupposing that, in speech articulation, making utterances effective is prior to keeping the naturalness or convention, we can assume that the reason why /p/ in /ps/ was historically elided must be that /p/ is redundant (reduction of /p/ hardly makes homonyms) rather than that it is hard to articulate. Actually out of 55,000 words, there are only 10 minimal pairs opposing to each other on having (or not having) the initial plosives in the consonant clusters described in RULE 1, e.g. knead vs. need (1795), know (5489) vs. no (8394), qneiss vs. nice (176), knight vs. night (1843), knit vs. nit, knot vs. not, knew (?) vs. new (4571).

Note: The numbers in the parentheses indicate that the word need,
for example, occurs 1795 times in account of 5 million words, which is described in A General Service List of English Words (Michael West, 1983). The words without number are not entered in the book, which implies they are little used in daily life. Inflectional forms attached "?" are not entered, either.

The consonant clusters described in RULE 2 and 3: /wr-/, /-mb/, /-mn/, and /-ln/, have a few opposing pairs, most of which are shown below.

/-mb/: jamb vs. jam, limb (172) vs. limn, plumb vs. plum, clime vs. climb (214),
/-mn/: damn vs. dam, hymn vs. him (?),
/-ln/: (kill (978) vs. kiln),

/"wr"-/: wrap (102) vs. rap, wrest vs. rest (1354),
wring vs. ring (544), write (1548) } vs. rite
wright right (2370).

Notice again that the pairs listed above would not stand in opposition if they were given their syntax or context. It is characteristic that each pair has a rare word as its partner except know vs. no, and knew vs. new. They simply show that the omission of the sound in question will hardly affect the recognition of the word. Word final consonant sequences, /-mb/ and /-mp/ are identical in terms of the consonant cluster, /m/ + bilabial plosive, however, /b/ of /-mb/ was historically elided but not /p/ in /-mp/. The difference seems to be accounted for by the fact that /b/  


2 All phoneticians and dictionaries don't agree /n/ in kiln is historically elided.
in /-mb/ makes four opposing pairs whereas /p/ in /-mp/ makes much more opposing pairs, for example, *cam* vs. *camp*, *limb* vs. *limp*, *slum* vs. *slump*.¹

From those we can claim that the phonemic redundancy must have been a critical feature in producing historical elision and that speaker's intuition of the phonemic redundancy also promotes contextual elision.

Gimson's following remark is not directly relevant to elision, but it supports the assumption that the speech articulation is affected by speaker's intuition of the phonemic redundancy:

> Since the initial cluster /kl, gl/ as in *clean*, *glean* are not in opposition with /tl, dl/ which do not occur initially, a substitution of /tl, dl/ for /kl, gl/ in such position may occasionally be heard both in RP and in other forms of English.²

Let us conclude this discussion. When some sounds are elided, they often leave their traces, whereby one is helped to retrieve the elided sounds. On the other hand, some phonemes in certain words are not essential for the words' identity, i.e. these phonemes are redundant in terms of the words' identification. We have called the former feature of sound "phonetic redundancy," and the latter "phonemic redundancy." Putting both of them together, we may call them "sound redundancy" in one word. A speaker's intuition

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¹ The lexicon examined here is, as is mentioned in the previous page, Longman Dictionary of Contemporary English.

of this sound redundancy must facilitate sound reduction. In other words, the phonological system regulating sound reduction involves the notion of sound redundancy as its component.
Conclusion

At the beginning we assumed that the prior reason why phonetic variation does not affect verbal communication is that any speech sound, no matter how sloppily it is articulated, is pronounced following some kind of rules.

To justify this assumption and clarify the phonological rules if any, we have examined the process and mechanism of sound reduction. It has become evident that the various factors affect speech articulation so that sound reduction occurs as a necessary and unexceptionable result. In fact sound reduction shows stable regularity in its occurrence, and some of the regularity can be explicitly described in the form of phonological rule.

We have seen how strictly our underlying desire to express meanings efficiently dominates our speech design. This primary notion affords a solid basis for the other factors concerning sound reduction. One of them is a speaker's intuition that a given sound is redundant in terms of identifying the words involved. Another factor is physical constraints derived from rhythm and the convenience of articulation.

Those factors are all integrated into a phonological system, which must be further embodied into a global phonological or linguistic system. One encodes or decodes any
reduced sounds by using this phonological system. Then, sound reduction does not affect recognition of words. The same would hold for the other kind of phonetic variation such as assimilation, dissimilation, coalescence, etc. Any phonetic variation, which is not caused accidentally nor arbitrarily but is strictly regulated by a global phonological system, will not spoil verbal communication.
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Abstract

The aim of this paper is to clarify the phonological system by which one encodes or decodes the various forms of utterances.

A speech sound shows great diversity in its phonetic features. Nevertheless the phonetic variation does not affect verbal communication. It may be because any phonetic variation, no matter whether it is interpersonal or intrapersonal, is governed by some rules which compose the phonological system shared by each person.

To accomplish this aim, what dominates the phonetic variation is mainly discussed with respect to consonant elision. First it is asserted in chapter one that speech articulation is strictly regulated by the underlying concept that the essential task of speech construction is to make the utterance the most efficient in terms of expressing the meaning. The process or mechanism of sound reduction is analysed on the assumption that sound reduction originates in the basic notion of utterance effectiveness. Eventually it becomes evident that a sound is usually elided in three steps which are organized hierarchically. That is, word(s) to be elided is/are specified by our primary desire to convey the message effectively. Syllables are next specified by the physical constraints of rhythm. Finally sounds are
defined by their environments with respect to convenience of articulation.

In chapter two, actual data involving consonant elision, both presented by phoneticians and observed by myself, are examined, and characteristic relations between consonant sequences and the elided consonants are discussed. They are described in the form of phonological rules. Three of them are concerned with historical elision and the others with contextual elision. Contextual elision involves two cases: word-internal elision and elision which takes place at the vicinity of word boundaries in connected speech.

In chapter three the process of articulation and acoustic features of consonant sequences described in chapter two are analysed to see why and how some consonant sequences specify a certain phoneme or syllable to be elided. It is proved that the sound environments described in the rules have their own intrinsic reasons for promoting the reduction of specific sound(s). This implies that a sound to be elided is not specified arbitrarily but follows the phonological rules of consonant sequence.

In chapter four it is claimed that a speaker's intuition of phonetic redundancy and phonemic redundancy also affects speech articulation. Phonetic redundancy corresponds to the phonetic features which appear or remain when a sound
is elided and enables one to infer the elided sound. Some typical cases are exemplified. On the other hand, some words involve certain sounds (phonemes) which might not be essential for the word to be identified. This is the case where there are few words in the lexicon whose complete forms are identical with the reduced form of the given word--this is called phonemic redundancy. Finally it is asserted that this phonemic redundancy must have been a critical feature in producing historical elision.

The speaker's underlying desire to make his utterance the most efficient, his intuition of phonetic redundancy and phonemic redundancy, and the physical constraints facilitating the omission of a certain sound in a specific sound environment are all integrated into a global phonological system internalized in each person. And one encodes or decodes a message by using this phonological system. Therefore most phonetic variations which are not caused accidentally nor arbitrarily but are strictly regulated by rules, will not spoil verbal communication.