Loanword Compound Truncation in Japanese

A study on Japanese learners' understanding of loanword abbreviations

Axel Bergman Engman

Supervisors: Shinichiro Ishihara

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Lund University
Centre for Languages and Literature
JAPK11

Abstract

In this study, the comprehension of English loanword truncations in Japanese will be investigated. Both Japanese native speakers and learners of Japanese will display their ability to truncate different kinds of *gairaigo* compound loanwords. I wanted to find out how native Japanese speakers and learners of the Japanese language compared in the truncating process. I found out that Japanese natives and experienced learners of Japanese performed similarly when they made regular double truncations and truncations stemming from words with the moraic N. Nonetheless, when the higher ranked constraints were involved in truncations, both Japanese natives and learners of Japanese faced difficulties. Japanese native speakers only had a small advantage. To my surprise, this made me learn that Japanese native speakers are only able to instinctively make truncations that follow applied rules under the right circumstances, that is, when long vowels, English diphthongs and geminates are not a part of the input words in the truncation, with only very few exceptions. Meanwhile, Japanese native speakers were the only participants who could successfully notice and provide their own truncated answers to trick questions.

Keywords: Truncation, long vowel, light syllabic truncation, geminate, moraic nasal, English diphthong, light syllable, heavy syllable, contiguity, prosodic word, mora, *gairaigo*, loanword, constraint

Conventions

This thesis will use the modified Hepburn system in cases where Japanese is written. All Romanized Japanese words will also use italics, while all double quotations indicate translations. Diacritic macron will not be used to indicate long vowels. Instead, double letters will substitute the diacritic macrons.

Abbreviations and Symbols

L	Light syllable
H	Heavy Syllable
σ	Syllable
μ	Mora
N	Moraic nasals
C	Consonant
V	Vowel
//	Phonemic marker

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1. Introduction

Since the arrival of the Portuguese in the 1500s, the importance of loanwords, especially those from English, has grown and become a vital part of the Japanese language. Truncations, however, is not only a common phenomenon in *gairaigo* (Foreign loanwords in Japanese), but in Sino-Japanese words as well. Suffixes like *-chan* and *-san* can be added to the end of names and create a truncated form. These are just some examples of truncations that can be seen in everyday Japanese.

Nevertheless, when speaking about truncations in the Japanese language one usually thinks of common double compound truncations like *toodai* (Tokyo University) in Sino-Japanese, or *sekuhara* (sexual harassment) in the *garaigo* stratum. There are also single word truncations such as *baito* (arbeit) and *irasuto* (illustration). I will explain all truncation phonetics further in chapter two and three. In order to get a better understanding of how truncations work, and what exactly is needed to make them, chapters two and three will be important. This is especially aimed for people with or without knowledge in the area, but also for those who might want a good summary of all relevant information.

I decided to write about this subject due to my personal interest about the history of Japan, especially how the old foreign relations worked with the western civilizations, and the history of the indigenous Ainu people. There is no denying that Europe and America have been big influences in the evolution of the Japanese language for hundreds of years, and still are to this day. Loanwords in Japanese are especially interesting just due to the history behind them, the usage of a different writing system (*katakana*), and just how big an effect foreign loanwords have had on Japanese. I hope my research will shed new light on how foreign people perceive Japanese and vice-versa.

1.1 Disposition

Chapter two will focus mainly on the history of *gairaigo* and other relevant phonetic background information, such as how mora and syllables work, general loanword phonology, epenthetic vowels, and feet. In chapter three, the theory behind truncation will be explained, starting with Sino-Japanese abbreviation phonology before going into single-word truncations, and finally, the theory behind the most relevant subject for this thesis, compound truncations. In the fourth chapter I will look at my personal research about compound truncations, starting with explaining my purpose, hypothesis, methodology and finally, a

thorough analysis on my findings and results. I will also include a conclusion at the end to summarize my thoughts and results from my research.

2. Previous research and loanword background

Since the beginning of the *Nanbansen* period during the 1500s, Japanese has constantly been introduced to new *gairaigo,* starting with loanwords from European languages like Portuguese. *Nanbansen* stems from the Chinese word *Nanban* which means "southern barbarian". It was a derogatory term for the barbarian tribes living outside the empire. The term was later adapted by the Japanese to refer to people who stemmed from southern Europe, after the Portuguese and Spaniards established trading outposts and colonies in south and southeast Asia. The term *nanbansen* means "*nanban* ships" and refers to not only the ships that sailed Portuguese and Spaniards missionaries, but also to those which sailed the Iberian merchants from this period. One word from this period that was adapted from Portuguese is the very well-known word *pan*, meaning bread. In the 1600s, Dutch borrowings became important, because Holland was the only western country with trade and contact with Japan. Dutch was also Japan's official language for foreign communication for more than 200 years. This was true up until Japan was forced to break their hundreds of years of isolation in 1853, when the Americans came and forced them to. However, it was not until the surrender of Japan after World War II and the US occupation lasting to 1952 that the prominence of English loanwords in the Japanese language became reality. Since then, new English loans have continuously streamed into Japanese (Irwin 2011: 29-57).

As a result, it is believed today that approximately 10% of the Japanese lexicon consists of *gairaigo*, but the usage can vary much between different kinds of media. For example, in advertising, *gairaigo* compromises more than 20% of all the vocabulary used, while only 4% of all vocabulary in books aimed at primary school children were *gairaigo*. Throughout all *gairago*, 95% are nouns according to a survey conducted by NINJAL (The National Institute for Japanese Language and Linguistics), in general, most of them are adapted from English (Damberg, 2015: 7-8).

As for how many *gairaigo* there are in the Japanese lexicon, a *katakana* lexicon published by Sanseido in 2000 contains 52,500 foreign words (Olah, 2007:178). By 2006 English donor words accounted for 91% of all loanword tokens in Japanese. At the same time, the number of donor words from other languages has plummeted (Irwin, 2016:163). We can speculate that this percentage and the number of foreign words has probably risen further, considering the growth and continued influx of English loanwords into Japanese.

2.1. Mora and syllable

Before discussing present and previous research on truncation in Japanese, I will first discuss theories related to loanword phonology, which is relevant because English is a very different language than Japanese. When adapting an English word into Japanese it undergoes some important phonological changes. I will start by briefly explaining mora and syllable, so readers that are less familiar with how Japanese words are built can understand how they play a role in the entirety of the Japanese language. In 2.2. I will discuss loanword phonology, to explain how loanwords are adopted to Japanese. Epenthetic vowels will be explained in 2.3. to see how sounds in Japanese has changed to be able to adapt foreign words. Finally, I will talk about feet which are the foundation of how truncations are built.

One essential part of Japanese phonology is the relation between mora (μ) and syllable (σ). Inaba (1998:106) uses haiku, a Japanese form of poetry to explain this relation. Haiku consists of 3 lines containing: five, seven, and five so called *onsetsu*. There is a common misconception in certain Japanese literature that equates *onsetsu* with syllables, which is not the case, as proven in figure (1a) and (1b).

(1)

a. *Onsetsu* = Mora = Syllable	Matsuo Basho (1644-1694)
fu ru i ke ya	“an old pond”
ka wa zu to bi ko mu	“a frog hopped into”
mi zu no o to	“the sound of water”
b. *Onsetsu* = Mora ≠ Syllable	Masaoka Shiki (1867-1902)
ka ki ku e ba	“eating persimmon”
ka ne ga na ru na ru	“the bell rings”
hoo ryuu ji	“at the Horyuji temple”

If *onsetsu* are translated as syllable, (1a) would confirm it as a true statement, since both the mora and syllable count agree with the *onsetsu*. Only if all syllables are light syllables, as they are in this example. However, when looking at example (1b) only the *onsetsu* and mora count concur, while the syllable count does not.

The part that stands out here is the last line in (1b) where *hoo ryuu ji* makes up for 5 mora. In the other lines, the correspondence between mora and syllable is easily understood. From

Kubozono (2015:11) and Matsui (2018:106) we learn that mora is the lower unit of syllable, but also that some mora cannot constitute a syllable on their own, which divides mora into two types. Mora that can constitute a syllable on their own are labeled as *jiritsu mora* (meaning independent mora), while the ones unable to constitute a syllable are known as *fuzoku mora* (attached mora). These are nowadays referred to as "head mora" and "non-head mora" respectively in English.

Kubozono further explains that mora that are unable to constitute a syllable on their own fall into four other types in Tokyo Japanese: (a) the second half of long vowels, (b) the second half of diphthongs, (c) moraic nasals, or the coda nasals, and finally (d) moraic obstruents, or the first half of geminate consonants. By applying the (a) type to the last line of the haiku illustrated in (1b) we understand that both *hoo* and *ryuu* are in fact both two mora respectively. Figure (2) further elaborates on the different non-head mora types.

(2) Non-head mora types (underlined letters indicate the non-head mora)

(a)	*to<u>o</u>*	"ten, tower"
(b)	*sa<u>i</u>daa*	"cider"
(c)	*ro<u>n</u>do<u>n</u>*	"London"
(d)	*ni<u>pp</u>on*	"Japan"

The two types of syllables are known as light and heavy syllables. Light syllables are monomoraic and heavy syllables are bimoraic, light syllables being the ones that are most used in modern Japanese (Kubozono 2015:13). Heavy syllables can further be divided into three types. The first type contains the first half of a geminate, or long consonant. The second contains a moraic nasal (N). The third type contains a long syllable and, the final type contains a diphthong (Kawahara, 2015:2-3). Nevertheless, there is also an uncommon third type known as superheavy syllables which are trimoraic. Superheavy syllables usually consist of a long vowel or English diphthong, which is then followed by a coda consonant. These occur only in the loanword stratum, not in native or Sino Japanese, and tend to be avoided (Kubozono 2015:13).

(3) Superheavy syllabic words

wain	"wine"
guriin	"green"

supein “Spain”

2.2. Loanword Phonology

More than half a century ago, the ordinary speakers of Japanese displayed a traditional phonemic system. The system is built on 16 consonants and the five vowels /a e i o u/, but the influx of *gairaigo* has made a considerable impact on the Japanese conservative phonetic system, making it much richer than before. An example would be the monomoraic articulations /we wi wo ye/. The word borrowings that makes up the *gairaigo* in Japanese are made from three different kinds of adaptation. These are called auditory, dictionary and spelling loans respectively (Irwin, 2011: 71-79).

(4) Word adaptations

Auditory loan

obun “oven” (obsolete spelling)

Dictionary loan

koppii “copy” (obsolete spelling)

Spelling loan

sutajio “studio”

Irwin’s definition of *gairaigo* includes the condition that a word must have “undergone adaptation” to Japanese phonology. Auditory loans are loans that have been adapted through auditory contact with other languages such as Dutch, and more recently English. Japan has no land borders and the indigenous Ainu language has had too few speakers to make any major auditory impact, which is why this is the most uncommon type. Dictionary loans are based on orthographic loans that have been assigned a dictionary pronunciation and have undergone adaptation. Spelling loans also have an orthographic source, but with an unassigned pronunciation that has been kept in the word adaptation. In modern times, *gairaigo* is most commonly from orthographic sources. This is due to teaching of foreign languages in Japan is done by almost exclusively monolingual Japanese speakers who must rely on grammar/translation methods, through reading, writing, and spelling rather than pronunciation (Irwin, 2011:76-79).

2.3. Epenthetic Vowel

Since Japanese words consisted of a restricted combination of certain vowel and consonant sounds, extra vowels were added to simplify pronunciation and adaptation of loanwords. This is what vowel epenthesis is and it usually refers to the vowels /u/ and /i/. Of these two vowels, /u/ is the most frequently encountered one. The epenthesis vowel /u/ is often weakened and subject for deletion, as well as being the shortest phonetically, which is why it is the most common. Loanwords using /u/ include: *sukuriin* (screen), *guruupu* (group), *guriin* (green) where *ku*, *pu* and *gu* respectively, are the consonants which have taken epenthetic /u/'s (Irwin, 2011:106).

Irwin (2011:107-112) later explains that epenthetic /i/ is most usually taken up by the consonants /k/ (*keeki*), but also in donor clusters "ks", "ksh" and "ch". Other less common epenthetic vowels include /o/, which is seen after /t/ and /d/. Then there is also epenthetic /a/ which is more common in older *gairaigo*.

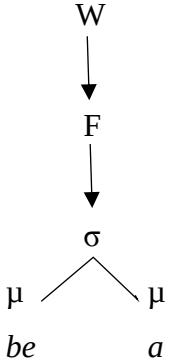
2.4. Feet

Inaba (1998:109) and Suzuki (1996:22-38) explain that above syllables and mora there is another unit, a foot. Feet are made from two mora, either one or two syllables, therefore being bimoraic. When truncating words in *gairaigo* phonology, the unit bimoraic foot is important. The binary foot plays a big role especially in the *gairaigo* constraint phonology.

In figure (5) Suzuki (1996:37-38) briefly explains how the foot looks like in the abbreviated word *beesuappu* (base up "salary increase"). We can see the first mora of both words *be* and *a* has made a foot. In double word abbreviations the preferred way to truncate is by combining the foot from both words used in the truncation (two plus two mora). I will talk more about this in the next chapter when we look at truncations.

(5) a.

b.



3. Truncation in Japanese

3.1. Sino-Japanese Truncating

One well-known type of truncation in Japanese is known as hypocoristic formation. It is identified by the suffix *-chan* which is added at the end of personal names and as a kinship term. In figure (6) we can see a few examples of unmodified hypocoristic names.

(6) Unmodified hypocoristic names

Junko > *Junko-chan*

Sachiko > *Sachiko-chan*

Akira > *Akira-chan*

Takako > *Takako-chan*

Yukiko > *Yukiko-chan*

However, the hypocoristic suffix is most often mapped to a bimoraic foot template, adding to a truncated form of the personal names, as displayed in (7) (Ito, 1990:214), (Poser, 1990:81), (Mester, 1990:479).

(7) Modified hypocoristic names

Junko > *Jun-chan*

Sachiko > *Sacchan*

Akira > *Aki-chan*

Takako > *Taka-chan*, *Taa-chan*, *Tacchan*

Yukiko > *Yuki-chan*

As long as the result is bimoraic, name truncations like *Taa-chan* and *Sacchan* given above are plausible. Truncations that end with either a light or heavy syllable are therefore acceptable. However, this means that name truncations like *Ta-chan* would violate this rule, since they are monomoraic (Ito, 1990 p. 214).

There are also other examples of unique kinds of name truncations. The name *Wasaburoo-chan* is an example in which a longer name is truncated to various alternatives with different

numbers of bimoraic feet, which makes a truncation like *Wasaburo-chan* possible. This name can truncate to *Buro-chan* and *Wasa-chan* as well (Ito, 1990:214-215).

More kinds of name truncations do exist, making *chan* not the only type. The common suffix -*san* (Mr, Ms), which is another type of kinship term, can be preceded by the prefix *o*-. Words like *okaasan* (mother) and *otoosan* (father) are known examples of these. Nonetheless, there are other ways to use the prefix *o*-. There are many cases where regular clients and customers of bars and geisha houses are referred in this way by the bargirls and geisha to emit an aura of anonymity. However, the stem differs by being a modified version of the clients' ordinary family names and being bimoraic. If the first syllable of the foot is heavy and does not end with a geminate, that first syllable can be used as the foot without any change. If the first syllable of the name is light, there is only one option, which is to lengthen the first mora. (8) illustrates a few examples of truncated names with the prefix *o*- (Mester, 1990:480) (Poser,1990:91-92).

(8) Names with prefix -*o*

Honda > *o-hoo-san*

Yasuda > *o-yaa-san*

Hattori > *o-haa-san*

Saiki > *o-saa-san*

Tanaka > *o-taa-san*

Both Mester (1990:479-480) and Poser (1990:92-93) write about a similar form to the last one we discussed. They call it "Rustic girls' names". This truncated form of names is made to familiarize girls' names, which is largely unused today. This type, however, is sometimes used when addressing maids and prostitutes but is largely disused in urban speech .

Similarly, regarding the client names discussed above, when truncating a rustic girl's name, the prefix *o*- is added in front of a name, although, in a rustic girls' name, the two first morae of the name are kept in the clipped form. Therefore, it is not possible to lengthen the first mora to meet the bimoraic demand. The truncated form must keep the same syllabification identically to how the original name looked like. No modifications of the base can be made at all. Refer to (9) to see how the rustic girls' names are made.

(9) Rustic girls' names

Hanako > *o-hana*

Yukiko > *o-yuki*

Takie > *o-taki*

Kaede > *o-kae*

Sino-Japanese truncated forms occur not only in names, but also in many other common words in the native Japanese language stratum. Sino-Japanese words can also have truncated forms, just like words in the *gairaigo* stratum. Ito (1990:229), Ito and Mester (2015:290) and George (2011:50-51) explain how stem compounds can enter the compounding process by themselves, in other words, how each word in the compound can stand as a single word. Observe the examples below in (10).

(10) Sino-Japanese stem compound truncations

dai + *gaku* > *daigaku* "big school"

sen + *see* > *sensee* "previous person"

ben + *kyoo* > *benkyoo* "effort-hard"

In *gairaigo*, truncations rely on the phonetic unit of the mora, which we will discuss more in the next section. In Sino-Japanese truncations, it is the orthographical unit of the *kanji* that is important. By taking the first morpheme from each word in the compound another form of truncation is possible. Loanword abbreviations are also modelled after this native abbreviation pattern.

(11) Sino-Japanese truncations

mogi + *shiken* > *moshi* "practice test"

Tokyo + *daigaku* > *toodai* "Tokyo university"

kokusai rengoo > *kokuren* "United Nations"

kootoo + *gakkou* > *kookoo* "high school"

There are a few cases when phonological changes might happen that differ from the example in (11). Sometimes there will be changes in the reading of the *kanji* post truncation.

(12)

Osaka + daigaku > handai	” Osaka university”
rakugo + kenkyuukai > otiken	”rakugo research club”

In the first example the *kun*-reading (Japanese reading) of *saka* in Osaka changed to its *on*-reading (Chinese reading) after truncation. While in the other example *raku* in *rakugo* changed from its *on* to *kun* reading and formed *otiken*. There is no linguistic explanation why this happens. The change in reading is purely due to a demand for novelty and uniqueness (Kobayashi, Yamashita, Kageyama, 2016:128-129).

3.2. Loanword Truncation

A learner of Japanese has probably noticed loanwords that appear in Japanese are long compared to native words in the language. To tackle this, many longer words and compound words are shortened down to make it easier for native speakers. There are many rules and constraints to truncating Japanese loanwords that I will bring up in this section before we look at my own research in the area, where the theory written here will be applied.

The rules and patterns are varied depending on what kind of loanword truncations are performed. However, rules also vary from researcher to researcher as well. First, I will look at what Labrune (2002:102-107) and Irwin (2016:175, 2011:130-137) say about single-word truncations.

Single-word truncation is also known as “mora-clipping”. There are three types. They are known as “back-clipping” (apocopes), “fore-clipping” (aphaeresis) and “mid-clipping” (discontinuous/syncope). The most common truncation type is back-clipping, where the back of a loanword is deleted, and the first one to five mora are kept intact. One and five mora truncations are not preferred, which many consider even incorrect. Labrune (2002:102-103) and Kubozono (2010:19-20) are two of the researchers who think so. Meanwhile, Irwin (2011:132), Ito (1990:217) and Koide (2015:25) think truncations with one, five and above five mora are possible, since they do occur, but in extremely few cases. Nevertheless, the general rule is to keep all single-word truncations between two to four mora long, and that bimoraic truncations are the most common and preferred process. The remaining truncation processes become rarer and less preferred as the number of mora increase.

The most dominant truncation process is back-clipping. Back-clipped words are made by removing all the mora after the second, third or fourth mora. There are cases of when back-clipped words are five mora or more, but this is not preferred. Instead, there is a slightly bigger preference to keep back-clippings bimoraic (Irwin 2011:73).

(13) Apocopes (back-clipping)

purofesshonaru > *puro* (L+L)

panfuretto > *panfu* (H+L)

apaatomento > *apaato* (L+H+L)

Fore-clipping occurs when the front elements of a word is deleted and the final two to four mora are retained, but never the final nor the final five or more mora. Instead of trying to keep fore-clipped words bimoraic as with back-clipped words, fore-clipped words tend to be bisyllabic instead. No definite explanation exists as to why these types of truncations happen, yet one theory states that these types are just older formations (Irwin 2011:78); (Labrune 2002:116).

(14) Syncope (fore-clipping)

arubaito > *baito* (L+L+L)

puropera > *pera* (L+L)

purattohoomu > *hoomu* (H+L)

The rarest and final form of single-word truncations are mid-clipped words. Here, mora from anywhere in the word can be truncated. Since this truncation type is varied in its output, it does not have a preferred syllable formation (Irwin 2011:79).

(15) Aphaeresis (mid-clipping)

moruhine > *mohi* (L+L)

insutorakutaa > *intora* (H+L+L)

koresupondensu > *korepon* (L+L+H)

To properly truncate a word, not only does the amount of mora matter, the constraints that explain how a word should and should not be truncated are just as important. In addition to the two to four mora constraint I spoke about on the previous page, Labrune (2002:103-105)

names many other constraints, starting with word binarity requirement and the no heavy syllable requirement. These two requirements later make up for different "productive patterns" that are preferred in truncation.

(16) Productive patterns

(L+L), (L+L+L), (H+L), (L+L+L+L) and (H+L+L)

All productive patterns are binary (under the foot, syllable or mora analysis), have bimoraic feet and do not end with a heavy syllable. Binarity is described by Ito and Mester (1992:21-22) as "branchingness", where the foot branches into two parts. Just like we can see in (5) in chapter 2.4. about feet. Other patterns known as "unproductive patterns" also appear, but less often. They are called unproductive due to not containing a bimoraic foot.

(17) Unproductive patterns

Non-binary: (L), (L+H+L), (H+L+L+L), (L+L+H+L), (H+H+L)

Ends with heavy syllable: (H), (H+H), (L+H), (L+L+H)

Neither non-binary or end with a heavy syllable: (H+H+H), (L+L+L+H), (H+L+L+H)

All these patterns are possible and reoccurring, some can be seen in the earlier examples (13) to (15).

While binarity and syllable ending can determine patterns, there are other constraints that decide the length of truncated words. Labrune (2002:105) gives the example *aruminiumu* (aluminum), which could give multiple truncated outputs (*aru, arumi and arumini*). Labrune believes that the length depends on the pitch accents of the words; she means that the base, right before the accent should be kept in the truncation.

(18) (Bold letters indicate pitch accentuation)

*sando**i**cchi* > *sando* (H+L) "Sandwich"

*irasuto**re**eshon* > *irasuto* (L+L+L+L) "illustration"

When the first or second mora is accented, however, Labrune (2002:107) goes on to say that this constraint should be violated to satisfy binarity and non-heavy syllable ending, because they are higher up in the constraint hierarchy. This implies that the word should be two mora if the base begins with light syllable, and three if the first is heavy.

Kubozono (2010:23-24) and Irwin (2011:75-76) do not agree with this hypothesis. They argue that there are too many exceptions for where this is not true. Dialectal differences, unaccented *gairaigo*, accent appearing after the fifth mora and other general exceptions also contradict her theory. Labrune's hypothesis cannot explain why the truncations in (19) are truncated in the way they are either. There is not enough evidence and research available to support her claims.

(19) ("*"indicates incorrect truncation result by using Labrune's hypothesis)

*tere**bi**shon* > *tere** (*terebi*) "television"

*aku**se**sarii* > *aku** (*akuse*) "accessory"

*ani**mee**shon* > *ani** (*anime*) " animation"

In summary, there are three ways to make single word truncations. These known as back-clipping (apocopes), fore-clipping (aphaeresis) and mid-clipping (discontinuous/syncope). They involve removing the rightmost, leftmost, and middle mora respectively, in order to shorten the words to between two, three, four or five mora. Five mora truncations, however, are not preferred. Then there are some rules and constraints that need to be followed. The most prominent rules are the productive and unproductive patterns, which decide how the truncations should look. Productive patterns are binary, have bimoraic feet and do not end with a heavy syllable, while unproductive patterns are neither.

3.3. Loanword compound truncation

Loanword compound truncations work different from single word truncations. There are some similar rules and patterns that are used for both, but generally they different for compounds. There are three different truncatory processes when abbreviating loanwords: compound clipping, morpho-orthographic truncation and ellipsis (Irwin, 2016:173).

Morpho-orthographic truncations are, unlike the other forms, not written with the usual *katakana*, *hiragana*, or *kanji*. Instead, two English compound elements are truncated by transposing to the Roman alphabet. All but the initial letters of each member are deleted (Irwin 2016:184-185).

(20) Morpho-ortographic truncations

Ofisu + *redii* > OL "office lady"

Goruden + wiiku > GW “golden week”

Ellipsis indicates deleting an entire word from the two words in the truncation. Most often, the final part is deleted, but truncating both ways is accepted. Sometimes, even the middle word is deleted in three element loanwords (Irwin 2016:191).

(21) (a) word with truncated back, (b) truncated front and (c) middle truncation.

a. *majikku + pen > majikku* “magic marker”

b. *sukuryuu + doraibaa > doraibaa* “screwdriver”

c. *sofuto + aisu + kuriimu > sofutokuriimu* “soft ice cream”

The final and most common truncation process, that I will put most emphasis on in this thesis is compound clipping. In this process the first elements of the two words in the truncation are kept, also known as double truncation. Nevertheless, both back- and front truncations also exist in the compound truncation stratum. There are a large number of rules and constraints that are ranked from less to more important, known as “optimality theory”. Sometimes some rules and constraints must be violated so truncations can be formed, in these cases the least important constraints are not prioritized (Nishihara, van de Weijer, Nanjo, Nishiyama. 2001:1-2, 9). These rules differ from source to source, but I will mainly be using the rules and constraints pitched by Nishihara, van de Weijer and Nanjo (2001:9-14).

(22) (a) are double truncations, (b) are back truncations and (c) is a front truncation.

a. *konbiniensu + sutoa > konbini* “convenience store”

paasonaru + koNpyuutaa > pasokon “Personal computer”

b. *suupaa + maaketto > suupaa* ”supermarket”

mini + sukaato > mini ”mini skirt”

c. *gooru + kiipaa > kiipaa* ” goal keeper”

The most common patterns for truncated compound loanwords are slightly different from the single-word truncations. The preferred number of mora for compound truncations is four mora, which occurs most frequently, taking the foot from each word base and combining them. Three mora is the second most common mora pattern, third most common is five mora, while all other mora amounts are rare in compound truncation. They do occur sometimes

depending on the constraint. (Irwin 2016:177; Koide 1998:24, 38; Labrune 1992:103; Kubozono 2002:94)

Nishihara, van der Weijer and Nanjo (2001:10-11) begin by describing the first constraint: "PrWd" (prosodic word), which states that the output should contain two mora (= 1 bimoraic foot) from the prosodic input words. The same rule also suggests that the second member should not contain a long vowel at the end, making the output three mora instead. Occurrences of words without long vowels do still appear sometimes (*rabu + hoteru > rabuho* "love hotel").

(23) Structure of truncation outputs

[[PrWd1] [PrWd2]]$_{PrWd}$

PrWd = prosodic word

where both PrWd1 and PrWd2 consist of two mora

Seku*sharu* + ***hara****sumento* > *sekuhara* "sexual harassment"

The other constraint is named "MinWd", which implies that in the truncated output, two mora should be retained from both input words. However, there is another higher ranked constraint "Leftmost" that should always be satisfied before these other two constraints. Leftmost requires that the leftmost elements from the words must be intact after truncation. This means that both combined words should at least have one leftmost mora kept from each word, even though it might violate the other two formerly mentioned constraints. Leftmost has a higher rank in the constraint hierarchy, while PrWd and MinWd are lower and equally ranked with each other (Leftmost >> PrWd, MinWd). In (23) it is seen that leftmost elements are kept in the truncation, following the leftmost requirement (Nishihara, van der Weijer, Nanjo, Nishiyama 2001:11, Ito 1990:232-233, Koide 2015:28-29).

The next requirement explained by Nishihara, van der Weijer and Nanjo is "NFLV", acronym for "no final long vowel" which is ranked higher than both PrWd and MinWd, but lower than "leftmost". This constraint explains why the words in (24) are truncated in the way they are. They also demonstrate how the MinWd constraint is violated to satisfy NFLV (Nishihara, van der Weijer, Nanjo, Nishiyama 2001:14).

(24) No Final Long Vowel

furii + *maaketto* > *furima* (furimaa*) "flea market"

terefoN + *kaado* > *tereka* (*terekaa**) "telephone card"

The highest ranked constraint that I will be using in my analysis in the next section is "Contiguity". This rule forbids "skipping" of segmental, or prosodic material (material based on mora, accent and intonation) in truncating. A typical example is elements with a geminate as shown in (25), where words could be expected to remove the double consonant in the truncation output (Nishihara, van der Weijer, Nanjo, Nishiyama 2001:12-13).

(25) Geminate word truncations

tekisuto + *bukku* > *tekisuto* (*tekibuku**)	"textbook"
potato + *chippusu* > *potechi* (*potechipu**)	"potato chips"
sutereo + *dekki* > *dekki* (*sutedeki**)	"stereo deck"

However, as we can see it is crucial to keep the geminate in truncation, and instead an entire prosodic word can be kept in the truncation, as a result to satisfy the contiguity constraint.

To summarize, the ranked constraint hierarchy is as follows, from highest to lowest:

- Contiguity (Contig): "segmental material that is contiguous in the input must also be contiguous in the output" (Nishihara, van der Weijer, Nanjo, Nishiyama 2001:12-13).
- Leftmost requirement (Leftmost): "The leftmost element of the constituent is retained in the truncation" (Nishihara, van der Weijer, Nanjo, Nishiyama 2001:11).
- No final long vowel (NFLV): *VV (No final long vowel in the end of the truncation)
- Minor prosodic word (MinWd): Leftmost two mora must be retained in truncation output for both elements.
- Prosodic word (PrWd): Truncated output must contain two mora from each input element. However, if the word ends with a long vowel, it is allowed to make the vowel short.

Despite all the rules, unusual truncations that violate rules with no explanation might occur, but they are few and far between.

4. The present study

4.1. Introduction

Previous research conducted by Petrulyté (2015:13-27) tested Japanese native speakers' ability to abbreviate and correctly apply phonological rules to new English loanwords in Japanese without any help. She concluded that even though Japanese native speakers do not learn how to truncate during their time in school, they are able to do it with their intuition only, whether they adhere to the rules or not. It turned out that a majority of native speakers were able to produce actual possible truncations for a wide variety of different single and compound loanwords, following actual rules and patterns.

My research, however, will mainly focus on the ability of Swedish learners of Japanese to truncate compound English loanwords in Japanese. I want to test if a foreigner who is learning Japanese could have a similar kind of intuition, and if not, where during the truncation steps are they failing? How do learners compare to Japanese native speakers? Does the participants' age and language experience reflect in the result as well?

4.2. Hypothesis

I predicted considering that most of the people that are taking the survey are Swedish natives, that truncating will prove difficult for them. Japanese is a language with a different kind of phonology compared to Swedish and English. However, I do believe that for experienced students, ordinary double truncations could prove to be easier. The richer vocabulary one has, the easier is it to see the two plus two mora patterns in many truncated loanwords. As for general rules, I do not think that one will know about them, unless one has studied constraints before. Therefore, knowing where it is acceptable and not acceptable to use a long vowel, as well as the no-skipping rule will probably be violated multiple times.

4.3. Methodology

For my research, I created a questionnaire with thirty-one compounds that I shared on social media. I received eighteen answers. The thirty-one compound words featured have been carefully thought out by taking many words from modern and relevant subjects, like "cryptocurrency mining" to name one. I did so in the hope that Japanese natives would not know in beforehand how these truncations are made.

Cryptocurrency + Mining	Web + Development
Battle + Royale	Negative + Sterotype
Record + Player	Social + Construct
Animal + Friends	Ethernet + Cable
Trigger + Warning	Coffee + Cup
Virtue + Signaling	Bottle + Opener
Book + Cover	Mission + Impossible
Protein + Pills	Aerobics + Excercise
Virtual + Reality	Town + Map
Fake + News	Foil + Card
Mental + Health	Happy + Hour
Humble + Bundle	Gender + Identity
Hand + Spinner	Hypertext + Preprocessor
Ice + Hockey	Deep + Learning
Cancel + Order	Cake + Icing
	Audio + Book

Table 1. Compound words used in the study.

However, it is important to note that this survey is mainly aimed towards learners of the Japanese language. Another reason for this was that learners of Japanese and Japanese native speakers with a low level of English proficiency might not know how some of these English words would be adapted into Japanese. I decided to make the entire questionnaire consist of five multiple choices on each question, as well as writing every word in Japanese *katakana* and English. I did this in order to make answers more concise and avoid confusing the participants due to language restrictions. The fifth choice of each question allows the participant to make their own example, in case they believe none of the given examples are good.

I also asked the subjects their age range, nationality, native language and how long they have studied Japanese. All the answers I got are from Japanese and Swedish natives only. I figured that age and the amount of time dedicated to Japanese studies could be important. Older generations of people are potentially not familiar with some of the words whatsoever due to generation differences. They might not be as invested in modern terms often used by younger groups of people. Also, a person that has studied Japanese for five years could

possibly grasp and have a better intuition for loanword truncations compared to a beginner, or someone who has only studied Japanese for two or three years.

The words I have picked out for this survey are based on various factors, not only the relevance of the words. All compound words are made with the different constraints that were pitched by Nishihara, van der Weijer and Nanjo (2001) in mind. Some constraints require certain rules, like the no long final vowel constraint and the contiguity constraint. In these cases, I have made sure to make words that allows me to test both constraints. I also made sure to make a few words that use a long vowel in the first compound input noun and words which use a long vowel in the second noun. I have used the same strategy for nouns with geminates, moraic N and English diphthongs, which makes it eight categories in total. I will test these constraints to be able to see how natives and learners of Japanese act when faced with these situations during truncations.

Of course, I have included normal double truncations and trick questions as well. I wanted to see whether subjects would make their own truncations on the trick questions or not. In some cases, truncations can be equally correct, which means that some questions have answers where two alternatives could be just as good. There are at least three words for almost each of my categories to give as accurate results as possible. Finally, all the previously named constraints have been considered when I made the alternative choices for every question.

In the next segment I will analyze the answers and results from the survey. All the answer alternatives and their expected truncations are available in the “appendix” section.

4.4. Result Analysis

My responses came from five native Japanese speakers and thirteen Swedish learners of Japanese. Three of the Japanese respondents were in the age range of 20-25, and the other two were 25-30 and 30-35 years of age. Seven of the Swedish participants have studied Japanese for 1-2 years, two for 2-3 years, three for 3+ years and, one for less than one year. Nine of the learners were 20-25 years of age, one 25-30 years, one 18-20 years old, and one 30-35-years old, which means that all participants are relatively young.

Informant no.	Nationality	Mother Tounge	Time studied	Age
1	Japanese	Japanese	Native speaker	30-35
2	Japanese	Japanese	Native speaker	25-30
3	Japanese	Japanese	Native speaker	20-25
4	Japanese	Japanese	Native speaker	20-25
5	Japanese	Japanese	Native speaker	20-25
6	Swedish	Swedish	3 years+	25-30
7	Swedish	Swedish	3 years+	20-25
8	Swedish	Swedish	3 years+	20-25
9	Swedish	Swedish	2-3 years	30-35
10	Swedish	Swedish	2-3 years	20-25
11	Swedish	Swedish	1-2 years	20-25
12	Swedish	Swedish	1-2 years	20-25
13	Swedish	Swedish	1-2 years	20-25
14	Swedish	Swedish	1-2 years	20-25
15	Swedish	Swedish	1-2 years	20-25
16	Swedish	Swedish	1-2 years	20-25
17	Swedish	Swedish	1-2 years	18-20
18	Swedish	Swedish	Less than one year	20-25

Table 2. List of participants.

All participants provided answers for all questions, but I noticed inconsistencies with a few of the native speakers of Japanese. One Japanese native speaker aged 30-35 wrote *tanshukushinai* (Do not truncate), as an answer on the questions: *Bukku kabaa* (book cover), *feiku nyuusu* (fake news), *kyanseru oodaa* (cancel order), *botoru oopunaa*(bottle opener), *misshon inposhiburu*(mission impossible), *foiru kaado* (foil card), *happi awaa* (happy hour), *diipu raaningu* (deep learning) and *oodio bukku* (audio book). What I found interesting after looking at this, was that the participant did not think that any of the truncations with a geminate in the first noun should have been truncated. This same Japanese native speaker also avoided many truncations with long vowels. Moreover, the subject was also the only of two people who created morpho-orthographic truncations, a form of compound truncation which I explained earlier in 3.3. The words *baacharu riariti* (virtual reality) and *jendaa aidentitii* (gender identity) were truncated as “VR” and “GI”, while *iisanetto keeburu* (ethernet cable) was truncated with both *katakana* and a morpho-orthographic letter “E ケーブル”

(*Ekeeburu*). The other participant who also used the morpho-orthographic truncation method in truncations was also a Japanese native speaker, who truncated *baacharu riariti* as "VR" as well. This person did not provide any other morpho-orthographic truncations.

I sadly do not have an explanation for why the subjects decided to make morpho-orthographic truncations. Morpho-orthographic truncations are not incorrect, but not preferred, and not what I expected to see in my survey. The morpho-orthographic truncation VR, on the other hand, is the commonly used abbreviation for "virtual reality" worldwide. This could probably have influenced the two native speakers to answer in the way they did. I have not seen the morpho-orthographic truncation "GI" before, but it cannot be considered incorrect either. *Ekeeburu* is the truncation that stands out the most. I have not seen truncations made in this order before. I assume that this truncation is just an irregularity. If I knew more about the participant who wrote this for an answer, I could maybe find out why they made this truncation. There could be more factors than just age that determines the habits and intuition of different subjects, such as socioeconomic status and geographical background. No learners of Japanese made any morpho-orthographic truncations, which can be explained by the fact that common learners of Japanese do not probably know that morpho-orthographic truncations even exist. Morpho-orthographic truncations are much more uncommon than regular double truncations after all.

I will now proceed to go through all categories one by one and analyze the different answers and compare them with each other. I have divided all questions into categories in order to understand the results easier. In the appendix I display all questions and alternatives which I included in the survey. I have also marked all truncations with "!*" as well as "*", which conveys that a constraint has been violated. The most important constraints start on the leftmost side of the table, lower ranked ones are on the right-most side, and correct truncations are marked with "→".

First, I will investigate how the subjects handled regular double truncations, which are made from light syllables exclusively. Thereafter I will look closely on how Japanese native speakers and learners of Japanese violated the relevant constraints. However, because the amount of informants are not as many as I had hoped, I decided to combine participants who have studied less than two years of Japanese into one group and the remaining into another.

4.4.1 Regular Truncations

Regular double truncations (Truncations with light syllables).

Cryptocurrency + Mining > *kurimai*	Battle + Royale > *batoroi*
Web + Development > *webudebe*	Animal + Friends > *anifure*

Table 3. Words used for regular double truncations and the expected outputs.

Expected Truncation Output	Expected	Others	Total answers
Japanese natives	**60,00% (12)**	**40,00% (8)**	**100,00% (20)**
Swedish	**59,62% (31)**	**40,38% (21)**	**100,00% (52)**
Less than two years	59,38% (19)	40,63% (13)	100,00% (32)
2 years+	60,00% (12)	40,00% (8)	100,00% (20)
Total	**59,72%(43)**	**40,28% (29)**	**100,00% (72)**

Table 4. Answers overall from the regular truncations.

In table (4) I calculated the frequency of expected and other answers by the participants for the regular double truncations, measured in both number and percentage. When we look at this table we can clearly see that Japanese natives made the least constraint violations. This must be due to the language intuition that many Japanese natives have, which Petrulyté (2015) concluded in her research. There are of course exceptions because sixty percent were correct, which can be explained by that participants are probably people without prior knowledge in truncation phonology, or other unexplained factors that affected native speakers' judgements. The results show that their experience and Japanese language intuition must have contributed to these results. Meanwhile, the learners of the Japanese language were just as good at truncating as the natives, no matter their experience with the Japanese language. People who studied Japanese for more than two years were just slightly better, with only less than one percentage in difference. In my hypothesis I believed that the results would be same in this category, depending on the length of Japanese education. It turned out to be a correct hypothesis in this category. I think that a majority of participants were able to figure out the easy two plus two mora patterns due to the fact that the words contained light syllables only.

Now, let us see how participants answered when divided into the different constraint categories. For the regular light syllabic truncations, only three of the five constraints were relevant: PrWd, MinWd and Leftmost.

PrWd Violations	Non-violation	Violation	Total answers
Japanese	**65,00% (13)**	**35,00% (7)**	**100,00% (20)**
Swedish	**71,15% (37)**	**28,85% (15)**	**100,00% (52)**
Less than two years	65,63% (21)	34,38% (11)	100,00% (32)
2 years+	80,00% (16)	20,00% (4)	100,00% (20)
Total	**69,44% (50)**	**30,56% (22)**	**100,00% (72)**

Table 5. Violations of the PrWd constraint within regular truncations.

By looking at the constraint lowest in the constraint hierarchy PrWd we can once again prove that light syllabic truncations are around equally easy to truncate for both native Japanese speakers and learners of Japanese. Approximately one third of everyone violated the constraint, and the amount of violations were more common for people with less experience in Japanese.

MinWd Violations	Non-violation	Violation	Total answers
Japanese	70,00% (14)	30,00% (6)	**100,00% (20)**
Swedish	**69,23% (36)**	**30,77% (16)**	**100,00% (52)**
Less than two years	68,75% (22)	31,25% (10)	100,00% (32)
2 years+	70,00% (14)	30,00% (6)	100,00% (20)
Total	**69,44% (50)**	**30,56% (22)**	**100,00% (72)**

Table 6. Violations of the MinWd constraint within regular truncations.

From this table we learn how often Japanese native speakers and learners of Japanese violated MinWd in their answers. When this constraint was violated, participants used too few mora from either the first or second input word in their truncations. For example, crypto currency mining was sometimes truncated as *kurima* and web development as *wedebe* instead of *kurimai* and *webudebe* respectively. As it turns out, just below a third of all participants failed on this constraint, both natives and learners of Japanese answering identically. Again, it is confirmed that truncations with only light syllables are generally easier to make. Also, both learners and Japanese native speakers are around equally good. Interestingly, the percentage of violations and non-violations happened to be equal to PrWd, which means MinWd and PrWd were just as common to violate in this category. Nonetheless, I want to specify that MinWd and PrWd were commonly violated, as they are closely related. In all cases where MinWd is violated, PrWd will be violated unless the truncation ends with a long vowel as we learned from earlier in 3.3, or when a mora present in neither of the input words is included.

Leftmost violations	Non-violation	Violation	Total answers
Japanese	**90,00% (18)**	10,00% (2)	**100,00% (20)**
Swedish	**94,23% (49)**	**5,77% (3)**	**100,00% (52)**
Less than two years	96,88% (31)	3,13% (1)	100,00% (32)
2 years+	90,00% (18)	10,00% (2)	100,00% (20)
Total	**93,06% (67)**	**6,94% (5)**	**100,00% (72)**

Table 7. Violations of the Leftmost constraint within regular truncations.

Leftmost was by far the most common constraint that the participants did not violate, there was a strong tendency to keep the leftmost mora in both compound components. Participants must have realized that truncations which do not use the leftmost mora sound unnatural, and that they did not follow the common pattern. This result does not really make any considerable impact on the result and as expected, natives and learners of Japanese answered much the same as with all other constraints for this category.

One interesting answer I noticed in this light syllabic category was the abbreviated form of "web development", which proved to be difficult for all participants, especially the Japanese native speakers. Only one Japanese native speaker and seven learners of Japanese answered with the expected truncation *webudebe*, which means that learners of Japanese had less difficulty with this truncation than the native Japanese. The other interesting pattern I noticed was that the Japanese natives mostly chose *wedebe* as an answer. *Wedebe* only contains three mora, which violates MinWd and PrWd in this case. I suspect that Japanese natives interpreted the *we* as two mora instead of one, since it is written with two characters (ウェ). This would of course have made more sense if this mistake was made by learners of Japanese, and not Japanese native speakers. This can of course also just be pure coincidence.

In the end, what we can learn from the standard light syllabic truncations is that Japanese native speakers and learners of Japanese are about equally good at making these truncations, with the exception of the participants with the least experience in Japanese. Moreover, this also proves my hypothesis correct so far.

4.4.2. Long vowel truncations

Long vowel in the first noun.

Record + Player > *rekopure*	Virtual + Reality > *baaria*
Deep + Learning > *diira*	Virtue + Signaling > *baashigu*

Table 8. Words used for long vowel truncations in the first noun and the expected outputs.

Expected Truncation Output	Expected	Others	Total answers
Japanese	**60,00% (12)**	**40,00% (8)**	**100,00% (20)**
Swedish	**19,23% (10)**	**80,77% (42)**	**100,00% (52)**
Less than two years	18,75% (6)	82,14% (26)	100,00% (32)
2 years+	20,00% (4)	87,50% (16)	100,00% (20)
Total	**30,56% (22)**	**69,44% (50)**	**100,00% (72)**

Table 9. Answers overall from long vowel truncation in the first noun.

As for truncations which stem from words with a long vowel in the first noun, there was undoubtedly a big difference between the subjects. All participants preformed even worse when both input nouns included a long vowel. Not a single participant truncated "deep learning" as the expected *diira* for example. However, the Japanese native speakers were best in this category by far, as expected. Now, let us take a look at how the constraint violations look for this category. For words with a long vowel in the first noun, all the constraints were violated at some point. I will begin by analyzing PrWd in the next table.

PrWd violations	Non-violations	Violations	Total answers
Japanese	**80,00% (16)**	**20,00% (4)**	**100,00% (20)**
Swedish	**57,69% (30)**	**42,31% (22)**	**100,00% (52)**
Less than two years	59,38% (19)	40,63% (13)	100,00% (32)
2 years+	55,00% (11)	45,00% (9)	100,00% (20)
Total	**63,89% (46)**	**36,11% (26)**	**100,00% (72)**

Table 10. Violations of PrWd within long vowel truncations in the first noun.

Among all the constraints for the long vowel category, PrWd is the most commonly violated for both Japanese native speakers and learners of Japanese, just like in the regular compound truncation category I analyzed before. The only difference is that more learners of Japanese violated PrWd than the natives compared to before.

MinWd violations	Non-violation	Violation	Total answers
Japanese	**80,00% (16)**	**20,00% (4)**	**100,00% (20)**
Swedish	**86,54% (45)**	**13,46% (7)**	**100,00% (52)**
Less than two years	84,38% (27)	15,63% (5)	100,00% (32)
2 years+	90,00% (18)	10,00% (2)	100,00% (20)
Total	**84,72% (61)**	**15,28% (11)**	**100,00% (72)**

Table 11. Violations of MinWd within long vowel truncations in the first noun.

Very few answers violated the MinWd constraint compared to the light syllabic truncations earlier. It seems like both Japanese native speakers and learners managed to understand and avoid violating this rule.

No final long vowel violations	Non-violation	Violation	Total answers
Japanese	**90,00% (18)**	**10,00% (2)**	**100,00% (20)**
Swedish	**88,46% (46)**	**11,54% (6)**	**100,00% (52)**
Less than two years	90,63% (29)	9,38% (3)	100,00% (32)
2 years+	85,00% (17)	15,00% (3)	100,00% (20)
Total	**88,89% (64)**	**11,11% (8)**	**100,00% (72)**

Table 12. Violations of NFLV within long vowel truncations in the first noun.

The no final long vowel constraint is not that relevant here because it can only be violated if the final mora is a long vowel. The only possibility to violate this constraint was in “deep learning” where a long vowel appears in the second mora of the second noun. The most notable thing in the truncation of “deep learning” was that most participants avoided the long vowels in the truncated output altogether (*dipura* instead of *diira*).

Leftmost violations	Non-violation	Violation	Total answers
Japanese	**95,00% (19)**	**5,00% (1)**	**100,00% (20)**
Swedish	**98,08% (51)**	**1,92% (1)**	**100,00% (52)**
Less than two years	100,00% (32)	0,00% (0)	100,00% (32)
2 years+	95,00% (19)	5,00% (1)	100,00% (20)
Total	**97,22% (2)**	**2,78% (2)**	**100,00% (72)**

Table 13. Violations of Leftmost within long vowel truncations in the first noun.

There are so few violations of the leftmost in this category, which means that the subjects must have found the truncations featuring a violation of the leftmost not very good. More or less everyone followed this constraint.

Contiguity violations	**Non-violation**	**Violation**	**Total answers**
Japanese	**80,00% (16)**	**20,00% (4)**	**100,00% (20)**
Swedish	**69,23% (36)**	**30,77% (16)**	**100,00% (52)**
Less than two years	62,50% (20)	37,50% (12)	100,00% (32)
2 years+	80,00% (16)	20,00% (4)	100,00% (20)
Total	**72,22% (52)**	**27,78%(20)**	**100,00% (72)**

Table 14. Violations of Contiguity within long vowel truncations in the first noun.

Contiguity violations were the second most common violations for truncations stemming from words with a long vowel in the first noun, although, not as common compared to all answers. In the answer which violated this rule I found one recurring theme. Many learners of Japanese and some natives simply skipped the long vowel completely in their truncations, which violates the contiguity constraint (*dipura, bacharia*).

In the end, we learn that long vowels are more difficult for learners of Japanese compared to the native speakers. Learners of Japanese either make the truncations too short by not including the long vowels, or they skip it completely to keep the mora right thereafter. Japanese native speakers made the least violations, as one can expect.

Long vowel in the second noun

Trigger + Warning > *toriwa*	Cancel + Order > *kyano*	Deep + Learning > *diira*

Table 15. Words used for long vowel truncations in the second noun and the expected outputs.

Expected Truncation Output	**Expected**	**Others**	**Total answers**
Japanese	**6,67% (1)**	**93,33% (14)**	**100,00% (15)**
Swedish	**23,08% (9)**	**76,92% (30)**	**100,00% (39)**
Less than two years	20,83% (5)	79,17% (19)	100,00% (24)
2 years+	26,67% (4)	73,33% (11)	100,00% (15)
Total	**18,52% (10)**	**81,48% (44)**	**100,00% (54)**

Table 16. Answers overall from long vowel truncation in the second noun.

In this category, we can see a deviation compared to when the abbreviations stemmed from words with a long vowel in the first word. Answers from both Japanese natives and learners

of the Japanese language were different from the expectation more than four-fifths of the time. I expected this category to be more difficult for all learners of Japanese since the rules are more advanced to adhere to than before, but clearer than what I expected. However, the low frequency of expected results from the Japanese native speakers can say something about the credibility of Nishihara, van der Jeroen and Nanjo's (2001) constraint theory when applied to words where the leftmost part of the second noun contains a long vowel.

PrWd violations	**Non-violation**	**Violation**	**Total answers**
Japanese	**73,33% (11)**	**26,67% (4)**	**100,00% (15)**
Swedish	**76,92% (30)**	**23,08% (9)**	**100,00% (39)**
Less than two years	75,00% (18)	25,00% (6)	100,00% (24)
2 years+	80,00% (12)	20,00% (3)	100,00% (15)
Total	**75,93% (41)**	**24,07% (13)**	**100,00% (54)**

Table 17. Violations of PrWd within long vowel truncations in the second noun.

As usual, violations of PrWd are relatively common, but a little less common than in the former categories. This is can be explained through the rules of the constraint that states that it does not count as a violation if the truncation is too short, in the case that the last mora is a long vowel. Instead, only MinWd is violated which we will look at next.

MinWd violations	**Non-violation**	**Violation**	**Total answers**
Japanese	**66,67% (10)**	**66,67% (5)**	**100,00% (15)**
Swedish	**53,85% (21)**	**46,15% (18)**	**100,00% (39)**
Less than two years	45,83% (11)	54,17% (13)	100,00% (24)
2 years+	66,67% (10)	33,33% (5)	100,00% (15)
Total	**57,41% (31)**	**42,59% (23)**	**100,00% (54)**

Table 18. Violations of MinWd within long vowel truncations in the second noun.

As expected, the MinWd constraint had a relatively high number of violations. However, to make a truncation that is based on a word with a long vowel in the second noun, MinWd must be violated. Otherwise, the higher ranked "No final long vowel" constraint will be violated. Therefore, it is actually expected to violate MinWd, and it seems like all participants followed that to some extent.

No final long vowel violations	Non-violation	Violation	Total answers
Japanese	**46,67% (7)**	**53,33% (8)**	**100,00% (15)**
Swedish	**74,36% (29)**	**25,64% (10)**	**100,00% (39)**
Less than two years	83,33% (20)	16,67% (4)	100,00% (24)
2 years+	60,00% (9)	40,00% (6)	100,00% (15)
Total	**66,67% (36)**	**33,33% (18)**	**100,00% (54)**

Table 19. Violations of NLFV within long vowel truncations in the second noun.

This constraint is more serious to violate, and it looks like a third of all participants had issues with it. I expected violations to be numerous in this case. Interestingly, it was more commonly violated by Japanese native speakers than learners of Japanese. This further puts the proposed constraint theory into question.

Leftmost violations	Non-violation	Violation	Total answers
Japanese	**86,67% (13)**	**13,33% (2)**	**100,00% (15)**
Swedish	**100,00% (39)**	**0,00% (0)**	**100,00% (39)**
Less than two years	100,00% (24)	0,00% (0)	100,00% (24)
2 years+	100,00% (15)	0,00% (0)	100,00% (15)
Total	**96,30% (52)**	**3,70% (2)**	**100,00% (54)**

Table 20. Violations of Leftmost within long vowel truncations in the second noun.

The violations of leftmost were once again very few. The two single answers that compromise the violations for this constraint, were answers from one participant who believed that there should not have been any truncation for that specific word, which resulted in a violation since no truncation was provided.

Contiguity violations	Non-violation	Violation	Total
Japanese	**46,67% (7)**	**53,33% (8)**	**100,00% (15)**
Swedish	**48,72% (19)**	**51,28%(20)**	**100,00% (39)**
Less than two years	37,50% (9)	62,50% (15)	100,00% (24)
2 years+	66,67% (10)	33,33% (5)	100,00% (15)
Totalsumma	**48,15% (26)**	**51,85% (28)**	**100,00% (54)**

Table 21. Violations of Contiguity within long vowel truncations in the second noun.

Finally, Contiguity was the most commonly violated constraint in this category. All participating groups showed difficulty with what they were going to do with the long vowel.

Just like before, participants tended to skip the long vowel and use the mora thereafter instead. This of course violates Contiguity, which is the most important not to violate.

What we can learn about long vowels is that they are hard to truncate, which is reflected in the answers from both learners of Japanese and the Japanese natives. Contiguity, PrWd and no final long vowel were the most problematic of the proposed constraints.

4.4.3. Moraic N Truncations

Contains moraic N in first noun.

Mental + Health > *menheru*	Humble + Bundle > *hanban*	Hand + Spinner > *hansupi*

Table 22. Words used for moraic N truncations in the first noun and the expected outputs.

Expected Truncation Output	Expected	Other	Total answers
Japanese	**86,67% (13)**	**13,33% (2)**	**100,00% (15)**
Swedish	**58,97% (23)**	**41,03% (16)**	**100,00% (39)**
Less than two years	54,17% (13)	45,83% (11)	100,00% (24)
2 years+	66,67% (10)	33,33% (5)	100,00% (15)
Total	**66,67% (36)**	**33,33% (18)**	**100,00% (54)**

Table 23. Answers overall from moraic N truncation in the first noun.

When a moraic N appeared within the first two mora in in the truncated output, participants showed little difficulty. Almost all Japanese native speakers successfully made truncations, as did three fifths of the learners of Japanese, but to a lesser extent. This has by far been the easiest category for everyone. The word “humble bundle” features a moraic N in both input words, even so, two-thirds answered the correct alternative *hanban*. All native Japanese participants successfully truncated “humble bundle”, and a little more than half learners of Japanese did as well. I am unable to see any special patterns that stand out. There were six different kinds of answers in total, where four only had one person who picked that specific answer. This makes me think many were unsure and picked at random, probably because they hesitate when the moraic N appears in both input nouns. Compared to regular double truncations, the amount of incorrect answers is about the same from Japanese learners, which reaffirms that when the participants are faced with something unknown, the answers tend to be random. Still, there are usually more than half of Japanese learners that pick the right answers.

In this category there were only two relevant constraints that were violated. These were the lesser ranked PrWd and MinWd constraints.

PrWd violations	**Non-violation**	**Violation**	**Total answers**
Japanese	**86,67% (13)**	**13,33% (2)**	**100,00% (15)**
Swedish	**58,97% (23)**	**41,03% (16)**	**100,00% (39)**
Less than two years	54,17% (13)	45,83% (11)	100,00% (24)
2 years+	66,67% (10)	33,33% (5)	100,00% (15)
Total	**66,67% (36)**	**33,33% (18)**	**100,00% (54)**

Table 24. Violations of PrWd within moraic N truncations in the first noun.

As usual, we can see that PrWd is a reoccurring issue for non-native speakers. PrWd also happens to be the only commonly violated constraint in this category. Participants most commonly violated this by making the truncations more than four mora in some cases. As one can expect, the Japanese native speakers made the least violations.

MinWd violations	**Non-violation**	**Violation**	**Total answers**
Japanese	**100,00% (15)**	**0,00% (0)**	**100,00% (15)**
Swedish	**92,31% (36)**	**7,69% (3)**	**100,00% (39)**
Less than two years	91,67% (22)	8,33% (2)	100,00% (24)
2 years+	93,33% (14)	6,67% (1)	100,00% (15)
Total	**94,44% (51)**	**5,56% (3)**	**100,00% (54)**

Table 25. Violations of MinWd within moraic N truncations in the first noun.

As we can see, only three people overall violated this constraint. It is too insignificant to say anything other than that the understanding and truncation of moraic N from the first noun is simple for all participants.

Contains moraic N in second noun.

Humble + Bundle > *hanban*	Social + Construct > *sookon*	Mission + Impossible > *misshoin*

Table 26. Violations of PrWd within moraic N truncations in the first noun.

Expected Truncation Output	**Expected**	**Other**	**Total answers**
Japanese	**46,67% (7)**	**53,33% (8)**	**100,00% (15)**
Swedish	**33,33% (13)**	**66,67% (26)**	**100,00% (39)**

Less than two years	33,33% (8)	66,67% (16)	100,00% (24)
2 years+	33,33% (5)	66,67% (10)	100,00% (15)
Total	**37,04% (20)**	**62,96% (34)**	**100,00% (54)**

Table 27. Answers overall from moraic N truncation in the second noun.

Suddenly, compared to the truncations based off words with moraic N in the first noun, the amount of expected answers has dipped. Only about two-fifths overall provided the expected truncations, and the learners of Japanese did worst. Nonetheless, there is a simple explanation for this. We know from before that participants handled words with moraic N like "humble bundle" well in the last category. The real issue is explained by the other two words "social construct" and "mission impossible", which happens to use a long vowel and geminate respectively. Therefore, I want to stress that the reason for all the unexpected answers are those two words. I will explain how in the upcoming tables.

PrWd violations	**Non-violation**	**Violation**	**Total answers**
Japanese	**66,67% (10)**	**33,33% (5)**	**100,00% (15)**
Swedish	**43,59% (17)**	**56,41% (22)**	**100,00% (39)**
Less than two years	37,50% (9)	62,50% (15)	100,00% (24)
2 years+	53,33% (8)	46,67% (7)	100,00% (15)
Total	**50,00% (27)**	**50,00% (27)**	**100,00% (54)**

Table 28. Violations of PrWd within moraic N truncations in the second noun.

As usual, PrWd proved to be difficult for learners of Japanese. Anyhow, there is not much to say about this constraint that we do not know since before. Only difference is that this time, Japanese natives also answered slightly different than before. However, this is because of the other higher ranked constraints coming up in the later tables.

MinWd violations	**Non-violation**	**Violation**	**Total answers**
Japanese	**93,33% (14)**	**6,67% (1)**	**100,00% (15)**
Swedish	**94,87% (37)**	**5,13% (2)**	**100,00% (39)**
Less than two years	95,83% (23)	4,17% (1)	100,00% (24)
2 years+	93,33% (14)	6,67% (1)	100,00% (15)
Total	**94,44% (51)**	**5,56% (3)**	**100,00% (54)**

Table 29. Violations of MinWd within moraic N truncations in the second noun.

MinWd had too few violations to make any significant impact. With the moraic N, we know that participants handled this constraint well. Same goes for “no long final vowel”, where only a single participant violated the constraint. This person had answered “do not truncate” on “mission impossible”, which led to the violation.

Leftmost violations	Non-violation	Violation	Total answers
Japanese	**86,67% (13)**	**13,33% (2)**	**100,00% (15)**
Swedish	**92,31% (36)**	**7,69% (3)**	**100,00% (39)**
Less than two years	100,00% (24)	0,00% (0)	100,00% (24)
2 years+	80,00% (12)	20,00% (3)	100,00% (15)
Total	**90,74% (49)**	**9,26% (5)**	**100,00% (54)**

Table 30. Violations of Leftmost within moraic N truncations in the second noun.

Leftmost is a constraint that is rarely violated by anyone. Most people seem to understand that one should keep the leftmost mora from both input words in the truncation. The answers simply reaffirm this fact.

Contiguity violations	Non-violation	Violation	Total answers
Japanese	**53,33% (8)**	**46,67% (7)**	**100,00% (15)**
Swedish	**66,67% (26)**	**33,33% (13)**	**100,00% (39)**
Less than two years	62,50% (15)	37,50% (9)	100,00% (24)
2 years+	73,33% (11)	26,67% (4)	100,00% (15)
Total	**62,96% (34)**	**37,04% (20)**	**100,00% (54)**

Table 31. Violations of Contiguity within moraic N truncations in the second noun.

Now, the real difference why so many answered unexpectedly in this category is simply due to the inclusion of not only PrWd, but also the Contiguity constraint. In this category I used the word “mission impossible”, where mission includes a geminate. In reality, participants did not create truncations based of moraic N in the second noun differently. In fact, they did just as good as when the moraic N was in the first noun. The real reason is that some words included elements like a geminate and a long vowel, which participants were considerably worse at. Therefore, many answers happened to violate multiple constraints. In the end, we have found out that compounds where the moraic N only appears in the first input noun, a clear majority could correctly truncate these. Same goes for words where moraic N only appears in the second input noun.

4.4.4. English Diphthong

Contains English diphthong in the first noun.

Fake + News > *feinyu*	Aerobics + Exercise > *eaeku*	Foil + Card > *foika*

Table 32. Words used for English diphthong truncations in the first noun and the expected outputs.

Expected Truncation Output	Expected	Other	Total answers
Japanese	**40,00% (6)**	**60,00% (9)**	**100,00% (15)**
Swedish	**33,33% (13)**	**66,67% (26)**	**100,00% (39)**
Less than two years	33,33% (8)	66,67% (16)	100,00% (24)
2 years+	33,33% (5)	66,67% (10)	100,00% (15)
Total	**35,19% (19)**	**64,81% (35)**	**100,00% (54)**

Table 33. Answers overall from English diphthong truncation in the first noun.

The next general pattern are words with English diphthongs. I tried to see how participants fared when faced with words that start with for example *ai* and *fei*. As we can see in table (33), the English diphthong was not easy to get right. I also want to note that some words contain a final long vowel, which means that MinWd must be violated in order to make the most correct truncation. Therefore, I will not put any emphasis on MinWd in this category.

PrWd violations	Non-violation	Violation	Total answers
Japanese	**33,33% (5)**	**66,67% (10)**	**100,00% (15)**
Swedish	**46,15% (18)**	**53,85% (21)**	**100,00% (39)**
Less than two years	45,83% (11)	54,17% (13)	100,00% (24)
2 years+	46,67% (7)	53,33% (8)	100,00% (15)
Total	**42,59% (23)**	**57,41% (31)**	**100,00% (54)**

Table 34. Violations of PrWd within English diphthong truncations in the first noun.

Again, violations of PrWd can also be seen in this category. This time, however, I noticed something interesting in the answers that can explain this. Most of the time, participants did not regard single the vowel characters /a/, /i/, /u/, /e/, /o/ as a single mora, as can be seen in (*earoekusa, foiruka*) for example. As a result, the truncations became more than four mora long and violated PrWd. Sometimes it was the other way around, where participants were uncertain whether to keep the single vowel or not, like after *fe* for example.

MinWd violations	Non-violation	Violation	Total answers
Japanese	**53,33% (7)**	**46,67% (8)**	**100,00% (15)**
Swedish	**35,90% (14)**	**64,10% (25)**	**100,00% (39)**
Less than two years	41,67% (10)	58,33% (14)	100,00% (24)
2 years+	26,67% (4)	73,33% (11)	100,00% (15)
Total	**38,89% (21)**	**61,11% (33)**	**100,00% (54)**

Table 35. Violations of MinWd within English diphthong truncations in the first noun.

In this category, two out of three truncations end with a final long vowel, which as a result have contributed to the violation of the MinWd constraint. However, the uncertainty of the single vowels, which I talked about in PrWd must also be noted. Either way, MinWd was a commonly violated constraint.

No Final Long Vowel violations	Non-violation	Violation	Total answers
Japanese	**66,67% (10)**	**33,33% (5)**	**100,00% (15)**
Swedish	**71,79% (28)**	**28,21% (11)**	**100,00% (39)**
Less than two years	70,83% (17)	29,17% (7)	100,00% (24)
2 years+	73,33% (11)	26,67% (4)	100,00% (15)
Total	**70,37% (38)**	**29,63% (16)**	**100,00% (54)**

Table 36. Violations of NFLV within English diphthong truncations in the first noun.

Just as I explained in the previous constraint, there are many final long vowel truncations in this category, which of course has led to some violations of the no final long vowel constraint. We know since earlier that participants had difficulty with making long vowel truncations.

Leftmost violations	Non-violation	Violation	Total answers
Japanese	**73,33% (11)**	**26,67% (4)**	**100,00% (15)**
Swedish	**84,62% (33)**	**15,38% (6)**	**100,00% (39)**
Less than two years	87,50% (21)	12,50% (3)	100,00% (24)
2 years+	80,00% (12)	20,00% (3)	100,00% (15)
Total	**81,48% (44)**	**18,52% (10)**	**100,00% (54)**

Table 37. Violations of Leftmost within English diphthong truncations in the first noun.

Leftmost is again a relatively rare constraint to violate, we know at this point that participants are very good at not violating this in general. However, sometimes it does happen.

Contiguity violations	Non-violation	Violation	Total answers
Japanese	**80,00% (12)**	**20,00% (3)**	**100,00% (15)**
Swedish	**97,44% (38)**	**2,56% (1)**	**100,00% (39)**
Less than two years	95,83% (23)	4,17% (1)	100,00% (24)
2 years+	100,00% (15)	0,00%)0)	100,00% (15)
Total	**92,59% (50)**	**7,41% (4)**	**100,00% (54)**

Table 38. Violations of Contiguity within English diphthong truncations in the first noun.

Contiguity was the least violated constraint in this category, which is due to the fact that there are no geminates, and no long vowel in the first noun that can be skipped. Nonetheless, prosodic elements were skipped in some answers. Two of the three answers that violated contiguity from the Japanese natives believed that no truncation should have been made, which further increased the violations of this and all the other constraints.

Before moving on, I want to discuss my findings from two questions. The first notable question in this category where the English diphthong appeared in the first input word, proved to be difficult for many. The newly coined expression "fake news" features an English diphthong in the first two mora of the first word, and a long vowel in the second word. In this question, people mostly had difficulties with whether to include the long vowel or not, and to decide if the *i* after the *fe* should be kept or not. This gives the impression that not only is the long vowel a difficulty as we know since before, but the English diphthongs as well, for both natives and learners of Japanese. Two Japanese native speakers even felt that no truncation was needed.

The other notable word that included an English diphthong in the first noun also proved to be very difficult. The answers were very mixed, and every alternative garnered a lot of responses. This means that there is a great amount of uncertainty in figuring out the most appropriate truncation for "aerobics exercise". The preservation of the *ea* in the output was no major problem, what proved to be difficult for everyone was what comes after *ea*. Some of the provided answers with elements that did not appear in the original input word to begin with, such as *easaiji*, *earobi* and *eaero*. Only two participants answered *eaeku* which is the expected truncation. However, it is worth to note that *earobi* is actually the commonly used

abbreviation of aerobics, which must have been a contributing factor. At the same time, aerobics exercise was intended as a trick question, which may have lowered the percentage of expected answers.

What can be learned from the compounds with English diphthong in the first noun is that participants had difficulty understanding the moraic value of regular vowels, which led to violations of primarily PrWd and MinWd.

Contains English diphthong in the second noun.

Bottle + Opener > *botoo*	Gender + Identity > *jenai*	Cake + Icing > *keeai*

Table 39. Words used for English diphthong truncations in the second noun and the expected outputs.

Expected Truncation Output	Expected	Other	Total answers
Japanese	**53,33% (8)**	**46,67% (7)**	**100,00% (15)**
Swedish	**28,21% (11)**	**71,79% (28)**	**100,00% (39)**
Less than two years	29,17% (7)	70,83% (17)	100,00% (24)
2 years+	26,67% (4)	73,33% (11)	100,00% (15)
Total	**35,19% (19)**	**64,81% (35)**	**100,00% (54)**

Table 40. Answers overall from English diphthong truncation in the second noun.

Just like with the last English diphthong category, the results for when an English diphthong appeared in the second noun are similar. Again, two questions include long vowels which has impacted the results. We can at least confirm that truncations of words that have an English diphthong in the first two mora are difficult.

PrWd violations	Non-violation	Violation	Total answers
Japanese	**73,33% (11)**	**26,67% (4)**	**100,00% (15)**
Swedish	**46,15% (18)**	**53,85% (21)**	**100,00% (39)**
Less than two years	50,00% (12)	50,00% (12)	100,00% (24)
2 years+	40,00% (6)	60,00% (9)	100,00% (15)
Total	**53,70% (29)**	**46,30% (25)**	**100,00% (54)**

Table 41. Violations of PrWd within English diphthong truncations in the second noun.

Once more, the difficulty of understanding moraic weight is reflected in the answers. Even though Japanese native speakers did better this time, it is a serious problem for learners of Japanese.

MinWd violations	Non-violation	Violation	Total answers
Japanese	**86,67% (13)**	**13,33% (2)**	**100,00% (15)**
Swedish	**76,92% (30)**	**23,08% (9)**	**100,00% (39)**
Less than two years	79,17% (19)	20,83% (5)	100,00% (24)
2 years+	73,33% (11)	26,67% (4)	100,00% (15)
Total	**79,63% (43)**	**20,37% (11)**	**100,00% (54)**

Table 42. Violations of MinWd within English diphthong truncations in the second noun.

This time, MinWd was violated less times than in the last category. Although, the issue with moraic weight, and difficulty with long vowels still stand.

No final long vowel violations	Non-violation	Violation	Total answers
Japanese	**73,33% (11)**	**26,67% (4)**	**100,00% (15)**
Swedish	**97,44% (38)**	**2,56% (1)**	**100,00% (39)**
Less than two years	100,00% (24)	0,00% (0)	100,00% (24)
2 years+	93,33% (14)	6,67% (1)	100,00% (15)
Total	**90,74% (49)**	**9,26% (5)**	**100,00% (54)**

Table 43. Violations of NFLV within English diphthong truncations in the second noun.

The difficulty with long vowels is interestingly only apparent from the Japanese native speakers in this example. However, only one of the compounds included a long vowel in this category (bottle opener).

Leftmost violations	Non-violation	Violation	Total answers
Japanese	**93,33% (14)**	**6,67% (1)**	**100,00% (15)**
Swedish	**89,74% (35)**	**10,26% (4)**	**100,00% (39)**
Less than two years	91,67% (22)	8,33% (2)	100,00% (24)
2 years+	86,67% (13)	13,33% (2)	100,00% (15)
Total	**90,74% (49)**	**9,26% (5)**	**100,00% (54)**

Table 44. Violations of Leftmost within English diphthong truncations in the second noun.

Just like before, leftmost is rarely violated. Leftmost has not been an issue among truncations based of nouns with English diphthongs.

Contiguity violations	Non-violations	Violations	Total answers
Japanese	**93,33% (14)**	**6,67% (1)**	**100,00% (15)**
Swedish	**76,92% (30)**	**23,08% (9)**	**100,00% (39)**
Less than two years	66,67% (16)	33,33% (8)	100,00% (24)
2 years+	93,33% (14)	6,67% (1)	100,00% (15)
Total	**81,48% (44)**	**18,52% (10)**	**100,00% (54)**

Table 45. Violations of Contiguity within English diphthong truncations in the second noun.

Finally, the violations of contiguity increased compared to before, which stems from the fact fact that "cake icing" includes a long vowel in the first noun. In the discussion about long vowels in section 4.4.2 we learned that the long vowel was commonly skipped when appearing in the first noun, which explains the increase.

The conclusion we can draw from English diphthongs in both the first and second noun is identical. Results for both categories were alike, for the exact same reasons. We learn that both Japanese native speakers and learners of Japanese have difficulty with the identification of moraic weight. Either they make the truncations too long or too short, because they do not understand what the character for a regular vowel correspond to. Therefore, participants ended up violating PrWd and MinWd very often. Although, it looks like learners of Japanese had the most difficulty with this, while around half of Japanese natives were able to make correct truncations. However, it also means that something is not right with the constraint theory, considering that many native speakers of Japanese chose unexpected truncations.

4.4.5. Geminate Truncations

Geminate in the first noun

Book + Cover > *bukkukaba*	Mission + Impossible > *misshoin*	Happy + Hour > *happiawa*

Table 46. Words used for geminate truncations in the first noun and the expected outputs.

Expected Truncation Output	Expected	Other	Total answers
Japanese	**0,00% (0)**	**100,00% (15)**	**100,00% (15)**
Swedish	**15,38% (6)**	**84,62% (33)**	**100,00% (39)**

Less than two years	4,17% (1)	95,83% (23)	100,00% (24)
2 years+	33,33% (5)	66,67% (10)	100,00% (15)
Total	**11,11% (6)**	**88,89% (48)**	**100,00% (54)**

Table 47. Answers overall from geminate truncation in the first noun.

Now, the final constraint category I will look at is the geminate. First, we will look at how answers differ when a geminate appears in the first noun in the first two mora. If I go from what I expected in my hypothesis, the results from table (47) are not that surprising. The geminate has also proven to be a difficult element in truncations. Nevertheless, not a single Japanese native speaker gave an expected answer. This means that there is further problems with the constraint theory when it comes to geminate words.

PrWd violations	**Non-violation**	**Violation**	**Total answers**
Japanese	**46,67% (7)**	**53,33% (8)**	**100,00% (15)**
Swedish	**43,59% (17)**	**56,41% (22)**	**100,00% (39)**
Less than two years	45,83% (11)	54,17% (13)	100,00% (24)
2 years+	40,00% (6)	60,00% (9)	100,00% (15)
Total	**44,44% (24)**	**55,56% (30)**	**100,00% (54)**

Table 48. Violations of PrWd within geminate truncations in the first noun.

If a geminate comes right after the first mora, it is unavoidable to make it shorter than three mora. If this is the case, either you violate PrWd by retaining more mora than required, or you keep either the first or second noun as the truncation. It is equally okay to keep an entire noun as a truncation because it only violates PrWd as well. For example, it is equally correct to truncate "mission impossible" to *misshon* and *inposhiburu*. It is also possible to truncate so you keep only the first mora in the word before the geminate, even though it violates both PrWd and MinWd. However, considering that only 11,11% of participants made expected truncations overall, people did not understand that you could do this, or geminate words have not been properly researched when making the constraint theory. What is important to note is that PrWd was almost always violated together with other constraints. When the participants truncated words with a geminate they either made the truncations too long or too short, because they did not know whether to keep the geminate or not in the truncation. In most cases they did not include the geminate, which made the truncations too short and violates both PrWd and Contiguity. For participants, this is what seems to be most natural for them.

MinWd violations	Non-violation	Violation	Total answers
Japanese	**60,00% (9)**	**40,00% (6)**	**100,00% (15)**
Swedish	**69,23% (27)**	**30,77% (12)**	**100,00% (39)**
Less than two years	62,50% (15)	37,50% (9)	100,00% (24)
2 years+	80,00% (12)	20,00% (3)	100,00% (15)
Total	**66,67% (36)**	**33,33% (18)**	**100,00% (54)**

Table 49. Violations of MinWd within geminate truncations in the first noun.

For the same reason as with PrWd, the violations of MinWd are largely due to truncations that included too few mora. To give an example, "book cover" should be truncated as *bukkukaba*. Instead, many participants truncated it as *bukaba*, which violates Contiguity, MinWd and PrWd, because it skips a prosodic segment and contains too few mora.

No final long vowel violations	Non-violation	Violation	Total answers
Japanese	**80,00% (12)**	**20,00% (3)**	**100,00% (15)**
Swedish	**100,00% (39)**	**0,00% (39)**	**100,00% (39)**
Less than two years	100,00% (24)	0,00% (0)	100,00% (24)
2 years+	100,00% (15)	0,00% (0)	100,00% (15)
Total	**94,44% (51)**	**5,56% (3)**	**100,00% (54)**

Table 50. Violations of NLFV within geminate truncations in the first noun.

The three violations of the no long final vowel constraint come from the single participant that did not think that any truncations were needed. Therefore, these violations are not relevant.

Leftmost violations	Non-violation	Violation	Total answers
Japanese	**73,33% (11)**	**26,67% (4)**	**100,00% (15)**
Swedish	**97,44% (38)**	**2,56% (1)**	**100,00% (39)**
Less than two years	100,00% (24)	0,00% (0)	100,00% (24)
2 years+	93,33% (14)	6,67% (1)	100,00% (15)
Total	**90,74% (49)**	**9,26% (5)**	**100,00% (54)**

Table 51. Violations of Leftmost within geminate truncations in the first noun.

Leftmost is seldom violated as usual. Even in the geminate category, we can see that participants are still very good at avoiding violations of this constraint.

Contiguity violations	Non-violation	Violation	Total answers
Japanese	**13,33% (2)**	**86,67% (13)**	**100,00% (15)**
Swedish	**33,33% (13)**	**66,67% (26)**	**100,00% (39)**
Less than two years	25,00% (6)	75,00% (18)	100,00% (24)
2 years+	46,67% (7)	53,33% (8)	100,00% (15)
Total	**27,78% (15)**	**72,22% (39)**	**100,00% (54)**

Table 52. Violations of Contiguity within geminate truncations in the first noun.

As I initially expected from the geminate category, Contiguity is the most usual constraint to violate of all other constraints in the category. The reason is due to one thing we discussed before in the example "book cover". Participants skipped the geminate to an overwhelming extent, which has resulted in the results we see now. I believe that they simply did not know how to truncate it and picked the alternative they thought sounded most natural to them.

Geminate in the second noun.

Ice + Hockey > *aiho*	Coffee + Cup > *kookappu*
Town + Map > *taumappu*	Audio + Book > *oobukku*

Table 53. Words used for geminate truncations in the second noun and the expected outputs.

Expected Truncation Output	Expected	Other	Total answers
Japanese	**60,00% (12)**	**40,00% (8)**	**100,00% (20)**
Swedish	**46,15% (24)**	**53,85% (28)**	**100,00% (52)**
Less than two years	37,50% (12)	62,50% (20)	100,00% (32)
2 years+	60,00% (12)	40,00% (8)	100,00% (20)
Total	**50,00% (36)**	**50,00% (36)**	**100,00% (72)**

Table 54. Answers overall from geminate truncation in the second noun.

At first glance from the table above, it looks like that participants made truncations much more easily when geminates appeared in the second noun, but this is not true. The truncations of "Ice hockey" (*hokkee*) and "coffee cup" (*kappu*) are regularly used in Japanese, but also in English. These truncations were commonly answered expectedly to back this fact up. In the end, truncations from geminates is still a major difficulty for all participants.

PrWd violations	Non-violation	Violation	Total answers
Japanese	**5,00% (1)**	**95,00% (19)**	**100,00% (20)**
Swedish	**21,15% (11)**	**78,85% (41)**	**100,00% (52)**

Less than two years	31,25% (10)	68,75% (22)	100,00% (32)
2 years+	5,00% (1)	95,00% (19)	100,00% (20)
Total	**16,67% (12)**	**83,33% (60)**	**100,00% (72)**

Table 55. Violations of PrWd within geminate truncations in the second noun.

As expected, most subjects violated PrWd again. We know this because the only way to make a geminate-based truncation to follow the constraint theory, is by violating PrWd. PrWd is also a commonly violated constraint in general.

MinWd violations	**Non-violation**	**Violation**	**Total answers**
Japanese	**55,00% (11)**	**45,00% (9)**	**100,00% (20)**
Swedish	**59,62% (31)**	**40,38% (21)**	**100,00% (52)**
Less than two years	56,25% (18)	43,75% (14)	100,00% (32)
2 years+	65,00% (13)	35,00% (7)	100,00% (20)
Total	**58,33% (42)**	**41,67% (30)**	**100,00% (72)**

Table 56. Violations of MinWd within geminate truncations in the second noun.

Again, since participants tend to violate Contiguity and PrWd, MinWd is automatically violated as well.

Leftmost violations	**Non-violation**	**Violation**	**Total answers**
Japanese	**95,00% (19)**	**5,00% (1)**	**100,00% (20)**
Swedish	**94,23% (49)**	**5,77% (1)**	**100,00% (52)**
Less than two years	90,63% (29)	9,38% (3)	100,00% (32)
2 years+	100,00% (20)	0,00% (0)	100,00% (20)
Total	**94,44% (68)**	**5,56% (4)**	**100,00% (72)**

Table 57. Violations of Leftmost within geminate truncations in the second noun.

Leftmost show very few truncations as usual. By now we can confirm that participants can understand that it is not acceptable to base double truncations on the rightmost elements of a word.

Contiguity violations	**Non-violation**	**Violation**	**Total answers**
Japanese	**85,00% (17)**	**15,00% (3)**	**100,00% (20)**
Swedish	**78,85% (41)**	**21,15% (11)**	**100,00% (52)**
Less than two years	68,75% (22)	31,25% (10)	100,00% (32)
2 years+	95,00% (19)	5,00% (1)	100,00% (20)

Total	**80,56% (58)**	**19,44% (14)**	**100,00% (72)**

Table 58. Violations of Contiguity within geminate truncations in the first noun.

As we can see, the fact that "ice hockey" and "coffee cup" were included as truncations meant that the violations of "contiguity" drastically decreased. To further attest this, I will thoroughly explain how answers for "ice hockey" "and "coffee cup" looked.

The commonplace word "ice hockey" consisted mostly of two answers. The most common truncation for this word was *hokkee* with ten of eighteen votes, and the other one was *aiho* with seven responses. Eight of the thirteen learners answered *hokkee*, which is "hockey" in English. The majority has most likely picked this answer because it is more common to say "hockey" instead of "ice hockey" in English. Japanese native speakers answered both alternatives to an almost equal extent, with a slight preference to *aiho*. Both answers are around equally correct. *Hokkee* only violates PrWd and *aiho* violates both MinWd and PrWd. However, if one wants to follow Nishihara, van der Weijer and Nanjo's theory exactly, *aiho* might be the best answer because it is not more than four mora, which *hokkee* is. Nonetheless, both are acceptable. Unfortunately, the existence of common abbreviated words may have been an additional factor affecting the results in general.

"Coffee cup" followed an almost identical pattern. The majority chose a single noun truncation, in this case, *kappu*. All but one Japanese native speaker chose this alternative, and seven of the thirteen learners of Japanese also chose *kappu*. The second most frequent answer *kookapu* was given by four Japanese learners and one Japanese native speaker. It is not a viable answer, since it violates contiguity by skipping the geminate in *kappu*. In this question *kappu* is the best answer because it only violates PrWd, but I also included another answer *kooka*, which only violates MinWd and PrWd and is therefore around equally as acceptable as *kappu*. Only one participant which was a learner of Japanese chose this answer. Because "cup" is more commonly heard that "coffee cup", it is understandable why many learners of Japanese chose *kappu*.

In the end, we can conclude that unexpectedly truncated forms of words with geminates, are largely due to a lack of knowledge about truncation phonology. This makes participants unable to know whether to keep the geminate or not in the final truncation. However, there is also doubt whether the constraint theory by Nishihara, van der Weijer and Nanjo (2001) can be completely credible. Many Japanese native speakers gave unexpected geminate truncations that do not follow the rules of the constraint theory, and since native speakers of Japanese are

native of the Japanese language, this fact cannot be overlooked. After all, Japanese native speakers probably answer what is most natural to them, so it is difficult to if the constraint theory is “correct” or not on all points.

4.4.6. Trick Questions

Trick questions.

Protein + Pills > *puropiru*	Negative + Stereotype > *negasute*	Ethernet + Cable > *iike*
Aerobics + Exercise > *eaeku*	Hypertext + Preprocessor > *haipuri*	

Table 59. Words used for trick questions and the expected outputs.

Correct Truncation Output	Expected	Other	Total answers
Japanese	**36,00% (9)**	**64,00% (16)**	**100,00% (25)**
Swedish	**6,15% (4)**	**93,85% (61)**	**100,00% (65)**
Less than two years	7,50% (2)	92,50% (37)	100,00% (40)
2 years+	4,00% (1)	96,00% (24)	100,00% (25)
Total	**14,44% (13)**	**85,56% (77)**	**100,00% (90)**

Table 60. Answers overall from trick questios.

In this final extra category, I added trick questions, which are questions with no appropriate answer alternatives provided. I wanted to see if anyone would notice the odd truncations and write their own correct alternatives. As we can see, participants did not do very well. Only the Japanese native speakers did well in this category.

PrWd violations	Non-violation	Violation	Total answers
Japanese	**44,00% (11)**	**56,00% (14)**	**100,00% (25)**
Swedish	**41,54% (27)**	**58,46% (38)**	**100,00% (65)**
Less than two years	40,00% (16)	60,00% (24)	100,00% (40)
2 years+	44,00% (11)	56,00% (14)	100,00% (25)
Total	**42,22% (38)**	**57,78% (52)**	**100,00% (90)**

Table 61. Violations of PrWd within trick questions.

From all earlier categories we learned that participants had difficulty with providing correct truncations that did not violate PrWd. Sometimes, there is no other way to truncate

without the violation of PrWd. It seems like the violations correlate with answers from most other categories in this case.

MinWd violations	Non-violation	Violation	Total answers
Japanese	**68,00% (17)**	**32,00% (8)**	**100,00% (25)**
Swedish	**70,77% (46)**	**29,23% (19)**	**100,00% (65)**
Less than two years	72,50% (29)	27,50% (11)	100,00% (40)
2 years+	68,00% (17)	32,00% (8)	100,00% (25)
Total	**70,00% (63)**	**30,00% (27)**	**100,00% (90)**

Table 62. Violations of MinWd within trick questions.

The same applies here as for truncations that violate PrWd. Sometimes, MinWd must be violated in order to satisfy higher ranked constraints.

No Final Long Vowel violations	Non-violation	Violation	Total answers
Japanese	**88,00% (22)**	**12,00% (3)**	**100,00% (25)**
Swedish	**89,23% (58)**	**10,77% (7)**	**100,00% (65)**
Less than two years	97,50% (39)	2,50% (1)	100,00% (40)
2 years+	76,00% (19)	24,00% (6)	100,00% (25)
Total	**88,89% (80)**	**11,11% (10)**	**100,00% (90)**

Table 63. Violations of NFLV within trick questions.

Only “ethernet cable” included a long final vowel, which explains the low violations of the no final long vowel constraint. Otherwise, the violations would be higher, which we can see if we look at the earlier analysis of truncations based on words with long vowels. However, we can observe that a total of ten participants violated this constraint out of the eighteen who answered on “ethernet cable”.

Leftmost violations	Non-violation	Violation	Total answers
Japanese	**100,00% (25)**	**0,00% (0)**	**100,00% (25)**
Swedish	**64,62% (42)**	**35,38% (23)**	**100,00% (65)**
Less than two years	65,00% (26)	35,00% (14)	100,00% (40)
2 years+	64,00% (16)	36,00% (9)	100,00% (25)
Total	**74,44% (67)**	**25,56% (23)**	**100,00% (90)**

Table 64. Violations of Leftmost within trick questions.

Leftmost is rarely violated as I have continuously stated. It is very uncommon for participants to find truncations that does not contain any leftmost elements natural. The amount of violation is a slightly higher than usual, but I believe it is pure coincidence. After all, all these questions were meant to confuse the participants.

Contiguity violations	**Non-violation**	**Violation**	**Total answers**
Japanese	**92,00% (23)**	**8,00% (2)**	**100,00% (25)**
Swedish	**83,08% (54)**	**16,92% (11)**	**100,00% (65)**
Less than two years	85,00% (34)	15,00% (6)	100,00% (40)
2 years+	80,00% (20)	20,00% (5)	100,00% (25)
Total	**85,56% (77)**	**14,44% (23)**	**100,00% (90)**

Table 65. Violations of Contiguity within trick questions.

For the contiguity violations, we can see that the number is very low. Of course, I did not include any types of truncations that violate Contiguity often, except for “ethernet cable”. Therefore, the violations are very few just as with the other categories I analyzed earlier that did not any long vowels or geminates.

What we learn by looking at the trick question category is that just a few people realized that they were being deceived. The only group of people that did considerably better was the Japanese native speakers, who could identify the odd alternatives, and provide expected truncations in more than a third of all instances. Learners of Japanese were much more reluctant to provide their own alternatives. In the end, it all came down to knowledge of the Japanese language and customs. Of course, Japanese native speakers have considerably more knowledge in Japanese than learners of Japanese.

5. Discussion

So, what does this survey really say about learners of Japanese and Japanese native speakers' ability to understand how truncations work? First, I want to note that everyone is not equally good at Japanese. Someone who has studied Japanese for two years could potentially be equally, if not better than someone who has studied Japanese for four years. All people have different learning curves, some might be fast learners, while some might be slow learners. At the same time, we do not know how long it was since any of the learners of Japanese last studied Japanese. The number of participants were unfortunately very few for this study, so it cannot represent the majority. Even if a Japanese native speaker is ten years older than another native speaker, it does not say anything about how good they are at their native language. I think this is important to take in account when making a survey and analyzing the results in the language stratum. There can never be precise accuracy that tells the truth about a specific group of people because everyone is different. Nevertheless, the number of participants could also have been much higher to further improve my results.

I analyzed different categories of truncations: regular double truncations, truncations of words with long vowels, words with the moraic N, words with an English diphthong, words with geminates and a few trick truncations. When I divided all answers into groups and investigated them, certain recurring patterns became easily noticeable.

Regular light syllabic double truncations were generally well truncated. Over half of all participants picked the expected answers for "cryptocurrency mining", "battle royale", "record player" and "animal friends". As I initially expected, nearly all Japanese natives successfully truncated all these words, and retained the first two leftmost mora from each input word. Learners of Japanese were generally good at truncating these words as well, better than what I thought they would be. Over half of all the Japanese learners were able to truncate every regular light syllabic double truncation. When I break it down further, the learners who had studied Japanese longer tended to answer correctly more frequently on regular double truncations.

However, when looking at how Japanese natives and learners of Japanese answered on long vowel word truncations, there were some differences. Japanese natives did best as expected, while learners of Japanese did somewhat worse. Only in "virtue signaling" and "foil card" did all participants do very well, while in the other words with long vowels on either side such as "trigger warning", "virtual reality", "cancel order", "deep learning" and "ethernet

cable" did they do worse. There is no major noticeable difference in answers when participants age and experience with the Japanese language is accounted for. Instead, I noticed how both learners of Japanese and Japanese native speakers displayed difficulty with whether the long vowel should be kept or not in the truncation. When the long vowel appeared in the first noun, participants seemed to have issues deciding whether to keep the long vowel, or if a long vowel corresponded to one mora instead of two. The most common occurrence was the latter. Which makes me wonder if native speakers of Japanese and learners of Japanese consciously differentiate between light and heavy syllables, but also the lack of knowledge in linguistics from the learners of the Japanese language. As a result, many truncations included too many mora. The second most common problem was primarily seen in "deep learning", where the input noun contained a long vowel. In this example, most participants simply skipped the long vowel in the first noun and kept the mora thereafter. This of course violates contiguity, and should not be done in a truncation, but there is no way for someone who does not know any constraints to figure this out.

When the first syllable was a long vowel heavy syllable in the second noun, there was a different problem, that both Japanese learners and Japanese natives of all ages had difficulties with. This can be seen in the word "trigger warning" in particular. Sometimes, the no final long vowel constraint is violated. Not only for this word, but other truncations from other categories where a long vowel appears in as well. This again comes down to whether the participant knows the constraint rules or not. For Japanese native speakers this was natural, which means that the constraint theory has not properly found a way to explain truncations with long vowels.

The third category I analyzed was truncations with the moraic N in either input noun. Of all categories, moraic N truncations was the easiest category for all participants. In all the examples over half of all participants successfully made truncations with the moraic N. For learners of Japanese, there was a bigger tendency for people who had studied Japanese for a shorter period to make unexpected truncations sometimes. Overall, everyone did exceptionally well, and I speculate that the moraic N made it easier to understand the appropriate length of the truncation. Even in "humble bundle", the learners of Japanese and Japanese natives alike proved that even when both input nouns use a moraic N, it does not make it more difficult. The moraic N works the same no matter if it is present in the first or second noun after truncation. As usual, the Japanese learners with less knowledge the Japanese did generally worse. However, everyone did much better than expected.

From truncations with English diphthongs I learned that answers were varied. Sometimes, both learners of Japanese and Japanese natives did well, and sometimes they did not. What I can notice when looking at the results from more difficult questions is that when the English diphthong contained more than two written characters, such as in *fei* in "fake news", participants thought that *fei* contained two mora, which is not true. Nonetheless, there also seemed to be an uncertainty on what single vowel characters corresponded to. Therefore, many frequent answers with an English diphthong in the first two mora included a third mora afterwards. To name an example, in "aerobics exercise", instead of simply writing *ea* in the first truncation element, we more often saw participants write *earo*.

The geminate category was the most difficult category for everyone. This was especially true when the geminate occurred in the first noun of the truncation, which can be explained through the commonly used words whose truncations the participants may already know since before. These were "ice hockey" and "coffee cup" to be specific. Both learners of Japanese and Japanese natives usually skipped the geminate in most abbreviations, which is strictly forbidden and violates the most important "no skip" constraint "contiguity".

Finally, what we can learn from the trick questions is that learners of Japanese almost never provided their own answers compared to the Japanese natives, who more easily detected the ill-formed truncations and provided their own answers. This resulted in the low frequency of expected answers from learners of Japanese, and the higher amount of expected answers from the native speakers. It seems that learners of Japanese tend to pick answers more randomly or pick the answer that sounds the best to them when faced with alternatives that all seem wrong, instead of writing something themselves. However, many unexpected answers from Japanese native speakers in the English diphthong, long vowel and geminate categories makes me wonder if the applied constraint theory accounts for truncated words with those features. The intuition of Japanese native speakers cannot be considered "incorrect", so all submitted answers from native speakers of Japanese cannot be wrong either.

6. Conclusion

To summarize, as it turns out, learners of Japanese and Japanese natives do not share a similar intuition for word abbreviations, just as I expected in my hypothesis. However, more experienced learners of Japanese were in many cases just as good as the Japanese native speakers in making regular double word truncations and truncations stemming from words with a moraic N. Less experienced learners did well too in these categories, but not as good in general.

The remaining categories proved to be difficult for everyone no matter the age and length of education. Participants with longer education in Japanese had a slight advantage occasionally. It boiled down to constraint rules that are not obvious to everyone. In long vowel truncations, participants often added another light syllable if the first syllable was a long vowel heavy syllable, which makes the truncation too long. Skipping of the long vowel was also recurring, which violates the contiguity rule. Sometimes, truncations ended with a long vowel even in other categories where the main emphasis was not on the long vowel. For English diphthongs, participants had difficulties understanding the moraic value of single vowels, which made many truncations longer than generally allowed. Truncations that stemmed from words with a geminate repeatedly violated the contiguity constraint by skipping the geminate completely, which is due to a lack of knowledge in truncation phonology for the learners of Japanese. Finally, practically all Japanese natives could notice the incorrect alternatives in the trick questions I provided and made their own correct alternatives. The learners of Japanese were much more reluctant to provide their own answers, which led to a big number of incorrect truncations. Learners of Japanese did simply not know what to do.

What I did not expect to learn from my research was that the intuition that Petrulyté (2015:13,27) claimed in her research that Japanese native people had is not true in all types of truncations when the constraint theory is considered. When Petrulyté surveyed native speakers, she included little to no words that could test how natives understand constraints other than regular light syllabic double truncations, and truncations stemming from words with the moraic N. Consequently, her analysis fails to account for a majority of *gairaigo* truncations, since only a select part of truncation types where only select lower ranked, less important constraints could be violated. In the end, for truncations where participants did not do as well, one had to know the constraint rules beforehand to be able to make an expected

truncation. Otherwise, participants would pick what alternative sounds best to them, or simply pick randomly, which was even the case with many learners of Japanese, who sometimes provided bizarre truncations. Nonetheless, a bigger study should be done that includes many more participants than what mine did to confirm my findings and improve accuracy, that also includes truncations that do not overlap with other categories to further make answers more reliable.

All my questions were answered, and my hypothesis was proven correct. Nevertheless, my research also left me with brand new unexpected information about native Japanese speaker's perception of long vowel, geminate, and English diphthong truncations that I did not know about before. At the same time Nishihara, van der Weijer and Nanjo's (2001) constraint theory could not predict answers from Japanese native speakers in the, long vowel, English diphthong and geminate categories. I think there is much more research that can be done in these areas.

Appendix

1.

Kuriputokarenshii mainingu	Contig	Leftmost	NFLV	MinWd	PrWd
kuriputo					!*
kurima				!*	*
→ *kurimai*					
kumai				!*	*

2.

batoru roiyaru	Contig	Leftmost	NFLV	MinWd	PrWd
baro				!*	*
baroi				!*	*
→ *batoroi*					
batoyaru		!*			

3.

Rekoodo pureeyaa	Contig	Leftmost	NFLV	MinWd	PrWd
rekoopure					!*
→ *rekopure*					
koopure		!*			
rekopuree			!*		*

4.

Animaru furenzu	Contig	Leftmost	NFLV	MinWd	PrWd
→ *anifure*					

marufure		!*			
animafuren					!*
afure				!*	*

5.

Torigaa waaningu	Contig	Leftmost	NFLV	MinWd	PrWd
toriwani	!*				
toriwaa			!*		
→ *toriwa*				!*	
→ *torigaa*					!*

6.

Baachuu shigunaringu	Contig	Leftmost	NFLV	MinWd	PrWd
baachushigu					!*
baachuushigu					!*
bachushigu	!*				
→*baashigu*					

7.

Bukku kabaa	Contig	Leftmost	NFLV	MinWd	PrWd
→*bukkukaba*					!*
bukukaba	!*				
bukaba	!*			*	
bukkuka				!*	*

8. (Trick question)

Purotein pirusu	Contig	Leftmost	NFLV	MinWd	PrWd

purotepi				!*	*
puropi				!*	*
pupiru				!*	*
teinpiru		!*			*

9.

Baacharu riaritei	Contig	Leftmost	NFLV	MinWd	PrWd
baacharia					!*
baria				!*	*
→ *baaria*					
bacharia	!*				

10.

Feiku nyuusu	Contig	Leftmost	NFLV	MinWd	PrWd
fenyuu			!*	*	*
fenyu				!*	*
→ *feinyu*				!*	
feinyuu			!*		*

11.

Mentaru herusu	Contig	Leftmost	NFLV	MinWd	PrWd
menhe				!*	*
menherusu					*
meheru				!*	*
→ *menheru*					

12.

Hanburu bandoru	Contig	Leftmost	NFLV	MinWd	PrWd
→ *hanban*					
hanba				!*	*
bandoru					!*
haban				!*	*

13.

hando supinaa	Contig	Leftmost	NFLV	MinWd	PrWd
handosupi					!*
→ *hansupi*					
hasupi				!*	*
supinaa					!*

14.

Aisu hokkee	Contig	Leftmost	NFLV	MinWd	PrWd
aihoke	!				
aiho				!*	*
→ *aihokke*					!*
→ *hokkee*					!*

15.

Kyanseru oodaa	Contig	Leftmost	NFLV	MinWd	PrWd
kyaoo			!*	*	
kyaoda	!*			*	*
kyanoo			!*		
→ *kyano*				!*	

16.

Webu deberoppumento	Contig	Leftmost	NFLV	MinWd	PrWd
wede				!*	*
wedebe				!*	*
budebe		!*		*	*
→ *webudebe*					

17. (Trick question)

Negateibu sutereotaipu	Contig	Leftmost	NFLV	MinWd	PrWd
negasutere					*
negasu				!*	*
teibusute		!*			
negataipu		!*			*

18.

Soosharu konsutorakuto	Contig	Leftmost	NFLV	MinWd	PrWd
sharukon		!*			
→ *sookon*					
soshakon	!*				
sooshakon					!*

19. (Trick question)

Iisanetto keeburu	Contig	Leftmost	NFLV	MinWd	PrWd
iisakee			!*		*
iisake				!*	
isakee	!*		*		

isakebu	!*				

20.

Koohii kappu	Contig	Leftmost	NFLV	MinWd	PrWd
kooka				!*	*
koka				!*	*
→*kappu*					!*
kookapu	!*				

21.

Botoru oopunaa	Contig	Leftmost	NFLV	MinWd	PrWd
botooo			!*		
botoopu	!*				
→*botoo*				!*	
botooopu				!*	*

22.

Misshon imposhiburu	Contig	Leftmost	NFLV	MinWd	PrWd
misshoinpo					!*
→ *misshoin*					!*
mishin	!*				
mishinpo	!*				*

23. (Trick question)

Earobikusu ekusasaizu	Contig	Leftmost	NFLV	MinWd	PrWd
earoeku					!*
eaero		!*		*	*
earoekusa					!*
bikueku		!*			

24.

Taun mappu	Contig	Leftmost	NFLV	MinWd	PrWd
→ *taumappu*					!*
tauma				!*	*
taumapu	!*				
taunma				!*	*

25.

Foiru kaado	Contig	Leftmost	NFLV	MinWd	PrWd
fokaa			!*	*	*
foirukaa			!*		*
→ *foika*				!*	
foiruka				!*	*

26.

Happii awaa	Contig	Leftmost	NFLV	MinWd	PrWd
→ *happiawa*					!*
hapiawa	!*				
happiwa				!*	*
hapiwa	!*				

27.

Jendaa aidentitii	Contig	Leftmost	NFLV	MinWd	PrWd
jena				!*	*
→ *jenai*					
jenden		!*			
daaai		!*			

28. (Trick question)

Haipaatekisuto puripurosessa	Contig	Leftmost	NFLV	MinWd	PrWd
hapuri				!*	*
tekipuri		!*			
haipu				!*	*
paapuri		!*			

29.

Diipu raaningu	Contig	Leftmost	NFLV	MinWd	PrWd
diiraa			!*		
→ *diira*				!*	
dipura	!*			*	
diirani	!*				

30.

Keeki aishingu	Contig	Leftmost	NFLV	MinWd	PrWd
keeaishi					!*
keekiai					!*
kekiaishi	!*				*
→ *keeai*					

31.

Oodio bukku	Contig	Leftmost	NFLV	MinWd	PrWd
oodibu				!*	*
→ *oobukku*					!*
→ *oodio*					!*
diobu		!*		*	*

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