

# Transliterating Icelandic Names into Japanese *Katakana* Words An Exploratory Study

## 1. Introduction

Transcribing sounds of one language into another can be problematic, especially with languages that use very different alphabets and sound systems, such as Japanese and English, or Arabic and English.<sup>1</sup> Japanese uses three orthographic systems concurrently; one of them, *katakana*, is used primarily for transcribing loan words and foreign names. However, *katakana* is a syllabary. This mirrors the Japanese intuition of the sound-shape of words: in segmental phonemic terms, Japanese has phonotactic constraints of an entirely different character from Icelandic ones. This difference forms the background to the discussion in this essay.

Thus when foreign names are transliterated into Japanese, the sounds are changed phonologically to fit into the Japanese sound system before being transcribed into *katakana*.<sup>2</sup> The National Language Council of Japan has published a series of guidelines for transcribing loan words, recognising at the same time that a transcription which follows the original sound too closely may not be ideal. As the Japanese sound system continues to develop, the set of sounds used to transcribe foreign words may tend either towards simplification or the enrichment of the Japanese sound system

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<sup>1</sup> Kevin Knight and Jonathan Graehl, "Machine Transliteration", *Computational Linguistic* 24(4)/1998, pp. 599–612, here p. 599.

<sup>2</sup> 石井久雄他、言葉に関する問題集—外来語編一、東京：文化庁、1997, pp. 18–19.  
石綿敏雄、外来語の総合的研究、東京：東京堂出版、2001, p. 29.

itself. The Council recommends that the guidelines should not be too strictly imposed, especially with regard to proper names, which may in fact be excluded from the guidelines altogether.<sup>3</sup> The transliteration of Icelandic place names and personal names into Japanese has not been fully systematized as yet, and there are many inconsistencies with respect to proper nouns in Japanese language tourist guide books and web pages on Iceland.

One of the first requirements for Icelandic students learning Japanese is to know how their names should be pronounced in the target language. Icelandic speakers must be able to recognize their own names; at the same time, the names must be made to fit into the Japanese sound system. There are several possible ways to transliterate names, and a consistent method for transcription is clearly a desideratum. In the process of transliteration, several decisions have to be made. For example, consonant clusters are not allowed in Japanese, with the exception of geminate or syllabic nasals; consequently, a vowel has to be inserted after every consonant. Normally this will be either [u]<sup>4</sup> or [o], but there are exceptions. Hence, a choice has to be made as to which vowel to insert. Another example involves the transliteration of a sound that does not exist in Japanese. A phonetically similar but quite distinct Japanese phoneme will be used as a substitute. Here the question would be which of the several possible options approximates the original word most closely. Some words are forced to undergo so many changes that the original word becomes hardly recognizable.

To some extent, the choice of which sound comes closest to the original language is a subjective one and may differ among individuals, although phonetic similarities can predict certain tendencies. The choice depends to a large extent on the native language of the person transcribing the sound: the underlying phonological differences of the two languages will help to determine which transliteration pattern Icelandic and Japanese speakers will prefer. Japanese is a mora-timed language, whereas Icelandic is syllable-timed. Japanese has three types of special moraic sounds, i.e. moraic nasals,

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<sup>3</sup> Ibid, pp. 57–81. (Detailed guidelines for loan words transcription and the discussion on whether or not the transcription should always aim to be closest to the original sound. )

<sup>4</sup> A broad phonetic transcription is used throughout the paper, e.g. using [u] instead of [ʉ], in order to avoid obscuring the argument with irrelevant details.

geminate consonants, and long vowels, illustrated by words such as /hoN/ *book*, /moR/ *already*, and /moQto/ *more*, where /N/ indicates a moraic n, /R/ the second element of a bimoraic vowel, and /Q/ the first element of a geminate consonant forming one mora; these three are usually categorised as special moraic phonemes.<sup>5</sup> In these cases an Icelandic speaker would pronounce /hoN/ with monosyllabic syllable timing, while the word has two moras, /ho/ and /N/ in Japanese, and is pronounced with two beats. An Icelandic speaker would likewise pronounce /moR/ [mo:] as one long syllable, but the word is pronounced with two mora beats, i.e. /mo/ and /R/, in Japanese. Similarly, /moQto/ would be a two-syllable word, /moQ/ and /to/ for Icelandic speakers, but is pronounced with 3 moras by Japanese speakers, i.e. /mo/ /Q/ /to/. Japanese furthermore tends to have boundaries between the nucleus and coda, whereas Icelandic prefers to set boundaries between the onset and nucleus. Figure 1 shows the syllable and mora structure of the three Japanese words given above. In the word /ho N/, Icelandic speakers tend to assume an underlying boundary between onset /h/ and nucleus /o/, allowing /oN/ to form an integral rhyme. Japanese speakers, on the other hand, have an underlying boundary between nucleus /o/ and coda /N/, as this is the boundary of the two moras. Again, the word /moR/ consists of two moras, but one syllable. For Japanese speakers, the boundary in this word will fall between /o/ and /R/, whereas for Icelandic speakers, it is between /m/ and /o/. Finally, /mo Q to/ is a two syllable / three mora word. Japanese speakers again divide the word according to mora boundaries, in two places. Icelandic speakers intuit the division according to syllables, in the place between onset and nucleus.

<sup>5</sup> 窪園晴夫、日本語の音声、東京：岩波書店、1999, pp. 147–153.

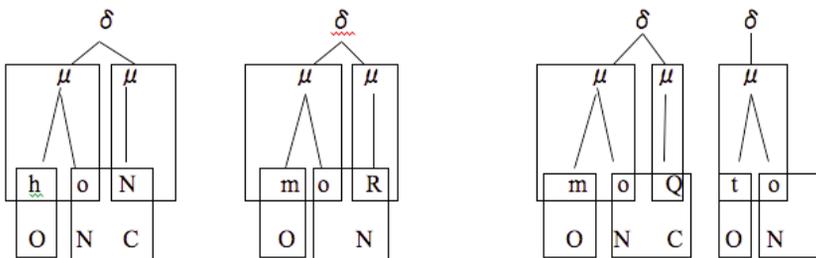


Figure 1. *hoN*, *moR*, and *moQto*. The upper boxes show the moraic structure, while the lower show the spurious onset/coda structure assumed by Icelandic speakers.

Thus these three phonemes, the moraic nasal, the second half of a long vowel forming a separate mora, and the first element of a geminate consonant, are problematic sounds for learners of Japanese to acquire.

## 2. The Study

For this exploratory study, eight transliteration problems (discussed below in section 3) were selected and Japanese and Icelandic subjects were asked to choose the closest equivalent to the original language. The subjects listened to recordings of a range of Icelandic personal names as they sound in Japanese according to different possibilities of transliteration, and reported on their preferences.

### 2.1 Scope

The aim of this study is firstly to examine which possible way of transcribing Icelandic personal names into Japanese will come closest to the original Icelandic pronunciation in the subjects' estimation; and secondly to examine the differences that come to light between Japanese and Icelandic subjects' perceptions of these problems.

### 2.2 Subjects

The subjects for this experiment were divided into three groups: 1) first-year Icelandic students of Japanese, 2) second-year Icelandic

students of Japanese, and 3) Japanese native speakers. The number of the subjects in each group was as follows: 1) 13 (four male and nine female students), 2) 8 (four male and four female students), and 3) 9 (one male and eight female students). There was an imbalance in the distribution of male and female students in groups 1) and 3), due to the limited number of native Icelandic speakers studying Japanese, as well as of native Japanese speakers living in Iceland. Due to these limitations, and the nature of this exploratory study as such, a broad observation of tendencies will be offered in preference to statistical analysis. At the outset of the experiment, it was not certain whether a clear distinction could be made between groups 1) and 2), given that the difference between them consisted in only one extra year of language study. At the time of the experiment, group 1) had studied Japanese and *kana* syllabaries for nine months and was already quite familiar with the transliteration of loan words from Icelandic/English into Japanese. However, longer exposure to the language may potentially make a difference in the transliteration process, and so, it was decided to observe the two groups separately.<sup>6</sup> The subjects in group 3) were native speakers of Japanese. Six of them had lived in Iceland for about nine months, two had never been to Iceland and had had no exposure to the language, and one had lived in Iceland for about two-and-a-half years. Five of the group spoke Tokyo dialect. Of the others, two were from the Kansai area, one from Okinawa, and one from Hokkaido, although no distinct dialectal accent could be observed in their daily conversation. The language background of both the Icelandic and Japanese subjects was rather diverse, in that many of them had some knowledge of languages other than Japanese and Icelandic. This is an additional reason for the choice of an observation methodology, rather than statistical analysis.

### 2.3 Procedure

Separate recordings were made of all the names pronounced by a native speaker of Icelandic (recording I) and the possible pronunciations in Japanese, as read by a native speaker of Japanese (re-

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<sup>6</sup> The first year students have spent 190 hours in class, whereas the second year students have spent 380 hours. The core textbook contains 600 vocabulary words for the 1st year, and another 600 for the 2nd year (1200 vocabulary words in total).

ording II)<sup>7</sup>. The recording was made with Edirol R-09HR, Roland, and the saved sound files played back by a Windows Media file through computer speakers.

First, a name from recording I was played, followed by the various possible pronunciations in Japanese from recording II. The subjects heard the tokens only once and chose the Japanese pronunciation (by number) that they thought came closest to the reading by the Icelandic native speaker. This was repeated for 60 tokens, consisting of 58 names, two of which were repeated for different sounds.

Although in both cases, the information and experimental procedure were the same, the mental process must have been slightly different for Japanese and Icelandic subjects. For Japanese subjects, the Icelandic pronunciation (I) represented the foreign sound, which had to be matched with one of the familiar-sounding Japanese pronunciations. For Icelandic speakers, the Japanese pronunciation (II) was foreign, and they had to choose among several options the sound which most closely approximated (I). There could thus be cross-linguistic, as well as individual, differences affecting the choice. The aim of the experiment was to determine whether an overall tendency could be observed.

All 60 test words were mixed and presented randomly to the subjects.

### 3. The eight problems

For the purposes of this study, eight different features were selected where problems in transliteration might occur. They are described in the following sections, and the responses of the subjects are discussed.

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<sup>7</sup> The problematic pronunciation of the Icelandic names are selected by the author, as well as the possible varieties of pronunciation in Japanese, based on the comparison between two languages' phonological systems and the general rules of transliteration in Japanese. Since there is no fixed rule for the transliteration of Icelandic sounds into Japanese, there is more than one possibility.

### 3.1 Geminate insertion

2 tokens: *Diðrik*, *Friðrik*

3 choices each: /-iku/, /-ikku/, /-i:ku/ (/i#ku/, /-iQku/, /-iRku<sup>8</sup>)

When English words are transliterated into Japanese, an extra consonant is frequently inserted between a monophthong and a consonant, making it a geminate.<sup>9</sup> For example, *cup* [kʌp] becomes [ka p pu], *bed* [bed] becomes [be d do] (or [be t to]). Also, proper names such as *Nick*, *Ted*, *Pat*, *Frederick* are pronounced [ni k ku], [te d do], [pa t to], [Φu re de ri k ku]. In *katakana*, the first element of a geminate, as [k] in [ni k ku], [d] in [te d do], or [t] in [pa t to], phonemically /Q/, is indicated by one small letter, ‘ㇿ’. When a short vowel is followed by a consonant, it tends to be transliterated with an extra consonant, forming a geminate. In Japanese, the insertion of the letter ‘ㇿ’ counts as an extra mora. Thus, a word such as *cup* is pronounced and written [ka p pu], with one extra consonant [p], which forms one mora on its own.

It should be noted here that Japanese has single consonant and geminate contrast in native words, e.g. [kite] (te-form of the verb *come*) – [kitte] (*stamps*), [niei] (*west*) – [niei] (*journal*). But a consonant tends to become geminated C → QC, when an English word is borrowed into Japanese. In other words, both geminated and non-geminated versions are allowed in native Japanese and it would appear not to be necessary to insert a geminate in the process of transliteration. However, in loan word phonology, a consonant tends to get geminated.

According to Shirai<sup>10</sup>, there are two cases where the geminate insertion occurs in loan words, i.e. word final consonant and ambisyllabic consonants. When the word ends with a syllable with a lax vowel and a single consonant, the last consonant tends to be geminated, e.g. *English* [ɪŋ ɡlɪʃ] > [i N ɡw ri ɛ ɛw], *clinic* [klɪn ɪk] > [ku ri ni k ku], *dog* [dɒɡ] > [do ɡ wu], *Cambridge* [keɪm

<sup>8</sup> The reader is reminded that /Q/ is a phonemic symbol of the first element of geminate consonants in Japanese, which forms one mora on its own, and that /R/ is a phonemic symbol of the second element of long vowels in Japanese, which forms one mora on its own.

<sup>9</sup> 鈴木俊二、“日本語の外来語における音節とモーラ”、*国際短期大学紀要*、10/1995, pp. 27–58, here pp. 42–44.

<sup>10</sup> Setsuko Shirai, “Gemination in loans from English to Japanese”, *MA thesis, University of Washington* 1999, pp. 1–7.

brɪdʒ] > [ke N bu ri d dzi] (C is mainly [p,t,k,s,ʃ,tʃ] but can be voiced). The ambisyllabic consonants (post-stress consonants), where the preceding vowel is lax, in loan words become geminated. e.g. *shopping* [ʃɒp ɪŋ] > [ɕɒp pi N ɡu], *essence* [es əns] > [e s se N su], *discussion* [dɪskʌʃən] > [di su ka ɕ ɕo N], *kitchen* [kɪtʃən] > [ki t tei N]. Therefore, it can be predicted that when presented with the Icelandic names pronounced by Icelandic speakers, Japanese subjects may choose the transliteration pattern with the geminate.

We can expect a similar process with Icelandic names such as *Diðrik* and *Friðrik*, i.e. that they will also be pronounced with a geminate. Whether an Icelandic native speaker will perceive it in this way or not is a different question. Perception of the difference between a singleton and a geminate stop consonant does not depend solely on the difference in length of the stop consonant in question. Apart from this primary cue, there are co-variants that affect the hearer's perception, especially in normal speech, where measuring the duration of the consonant is no straightforward matter. These co-variants include the length of the preceding vowel, its intensity, /F0/ as well as the voice quality of the vowel that follows the consonant(s). There is also a cross-linguistic difference. For example, in languages such as Icelandic, the duration of the vowel preceding the geminate stop is said to be shorter than that of the vowel preceding the singleton stop. However, in Japanese, the opposite seems to be the case.<sup>11</sup> Due to these cross-linguistic differences in the perception of geminate vs. singleton consonants, it would be plausible to think that Icelandic speakers may perceive the presence of a geminate in names differently from Japanese speakers.

## Results

From Table 1.a. below, it appears that the general tendency for Japanese speakers was to insert geminate /Q/ and pronounce the name /di zu ri Q ku/ ([di zu ri k ku]), /fu ri zu ri Q ku/ ([fu ri zu ri

<sup>11</sup> Kaori Idemaru and Susan G. Guion, "Acoustic Covariants of Length Contrast in Japanese Stops", *Journal of the International Phonetic Association* 38(2)/2008, pp. 167–186, here pp. 167–170.

k ku]). Icelandic speakers, on the other hand, tended to prefer the pronunciation without geminate, [di zu ri ku], [fu ri zu ri ku]. Vowel lengthening /R/ was not a popular choice in any of the groups. None of the Japanese speakers chose a long vowel. A slight difference was observed between first-year and second-year students of Japanese: none of the second-year students chose the geminate, whereas among the first-year students, the number of speakers who chose the geminate was equal to the number who did not. This may suggest that first-year students do not perceive the difference between the pronunciations with and without geminate, e.g. [di zu ri k ku] vs. [di zu ri ku], whereas second-year students seem to differentiate clearly between these two types. This would seem to indicate that after two years of study, students have developed the ability to distinguish the presence or absence of the geminate in Japanese.

	1st year	2nd year	1st & 2nd year	Japanese
/iQku/	(13) 11	0	(13) 11	14
/iRku/	2	2	4	0
/i#ku/	(13) 11	14	(27) 25	4

Table 1.a Choice of pronunciation for names that end with /-ik/.<sup>12</sup>

Table 1.b. shows the results for individual names. The tendency is the same as in Table 1.a. The first-year students' choice between /Q/ (with geminate) and /#/ (without geminate) seems quite random, too.

<sup>12</sup> The total number of the responses for 1st year students should be 26 (13 subjects×2 tokens). However, two subjects chose two answers instead of one for 'Diðrik', and therefore were disqualified. The numbers in brackets include all data collected.

	1st year	2nd year	1st & 2nd year	Japanese
Diðrik				
ディズリック [di zu ri k ku]	(5) 3	0	(5) 3	8
ディズリーク [di zu ri i ku]	1	2	3	0
ディズリク [di zu ri ku]	(9) 7	6	(15) 13	1
Friðrik				
フリズリック [ɸu ri zu ri k ku]	8	0	8	6
フリズリーク [ɸu ri zu ri i ku]	1	0	1	0
フリズリク [ɸu ri zu ri ku]	4	8	12	3

Table 1.b Choice of pronunciation for names that end with /-ik/ (individual names).

### 3.2 Treatment of Icelandic diphthong [au]

6 tokens: *Álfrún*, *Ásta*, *Ágúst*, *Ásgeir*, *Stefán*, *Kristán*

4 choices each: [a], [au], [a u], [a:]

Long vowels such as [a:] /aR/, and diphthongs such as [au] are sounds which in Japanese will form an extra mora, where there is one syllable. This is again represented orthographically in the Japanese writing system. However, [au] can be pronounced in one beat, as in English and Icelandic, or as [a u] in two beats. The latter is a more traditional Japanese sound, and the former is closer to the Icelandic pronunciation. These options can be represented orthographically: [au] = アウ, [a u] = アウ. However, when Japanese speakers read these *katakana* writings, they tend to pronounce both in the same way. In this experiment, both pronunciations were tested. They were intentionally read in a slightly different way: [au] in one mora beat, with the latter part of the diphthong pronounced with less emphasis than the former, and [a u] in two mora beats, with the latter part of the diphthong pronounced clearly. This was done to see whether the second part of the diphthong [au] in Icelandic names would be clearly perceived and transferred into Japanese pronunciation, as well as to determine how important the presence of that sound is for both Icelandic and Japanese speakers when the word is transliterated into Japanese.

## Results

For this category, there was a clear tendency for both Japanese and Icelandic speakers to choose the diphthong [au]. The second most popular choice was the sequence of two single vowels [a u]. If it is assumed that the subjects did not differentiate between the two sounds [au] and [a u], the general tendency is further strengthened, and suggests that the second element of the diphthong [au] cannot be omitted in the process of transliteration. A comparatively small number chose [a] without [u], and very few chose lengthened /aR/ ([a:]).

	1st year	2nd year	1st & 2nd year	Japanese
/a/	(8) 6	9	17	12
/au/	(47) 46	(25) 22	(72) 68	26
/a u/	21	(17) 14	(38) 35	14
/aR/	(4) 3	0	(4) 3	1

Table 2.a Choice of pronunciation for names that contain diphthong /au/.

Table 2.b shows the results with individual names. The overall tendency, as well as exceptions occurring with some names, may be seen clearly. For example, with *Álfrún*, the majority of Icelandic speakers chose a single vowel [a]. In the case of *Ágúst*, more of the Icelandic subjects chose the vowel sequence [a] and [u], rather than diphthong [au]. This may be because of the fact that the Icelandic diphthong [au] has phonetic variables and is pronounced as a long diphthong in *Ágúst*, but short in *Álfrún*.<sup>13</sup> For *Stefán* and *Kristján*, Japanese speakers chose [a], i.e. [su te fa N], and [ku ri su tea N], as well as [au]. This might be due to an association with the English names *Stephan* and *Christian*. Another reason for this could be that [au] in these two names is in an unstressed syllable, and therefore the sound is weak. Although there are individual differences, the general tendency is consistent in this category.

<sup>13</sup> In Icelandic, vowels or diphthongs are pronounced shorter when they are followed by two or more consonants than when no consonant or only one consonant follows. See Kristján Árnason, “Atkvæðagerð, hljóðskipun og lengd”, *Íslensk tunga, 1. bindi. Hljóð. Handbók um hljóðfræði og hljóðkerfisfræði*, meðhöfundur Jörgen Pind, Reykjavík: Almenna bókafélagið, 2005, pp. 180–222, here p. 185.

	1st year	2nd year	1st & 2nd year	Japanese
Álfrún				
アルフルン [a ru $\phi$ u ru N]	5	8	13	2
アウルフルン [au ru $\phi$ u ru N]	2	0	2	3
アウルフルン [a u ru $\phi$ u ru N]	4	0	4	3
アールフルン [a a ru $\phi$ u ru N]	2	0	2	1
Ásta				
アスタ [a su ta]	0	0	0	1
アウスタ [au su ta]	13	(8) 7	(21) 20	7
アウスタ [a u su ta]	0	(1) 0	(1) 0	1
アースタ [a a su ta]	0	0	0	0
Ágúst				
アグスト [a gu su to]	(2) 1	0	(2) 1	1
アウグスト [au gu su to]	2	(2) 1	(4) 3	4
アウグスト [a u gu su to]	(10) 9	(7) 6	(17) 15	4
アークスト [a a gu su to]	0	0	0	0
Ásgeir				
アスゲイル [a su ge i ru]	0	0	0	1
アウスゲイル [au su ge i ru]	6	1	7	5
アウスゲイル [a u su ge i ru]	6	7	13	3
アースゲイル [a a su ge i ru]	1	0	1	0
Stefán				
ステファン [su te $\phi$ a N]	(1) 0	0	(1) 0	4
ステファウン [su te $\phi$ au N]	(12) 11	(7) 6	(19) 17	4
ステファウン [su te $\phi$ a u N]	1	(2) 1	(3) 2	1
ステファーン [su te $\phi$ a a N]	0	0	0	0
Kristján	0	0	0	0
クリスチャン [ku ri su t $\phi$ a N]	0	1	1	3
クリスチャウン [ku ri su t $\phi$ au N]	12	7	19	3
クリスチャウン [ku ri su t $\phi$ a u N]	0	0	0	2
クリスチャーン [ku ri su t $\phi$ a a N]	1	0	1	0

Table 2.b Choice of pronunciation for names that contain diphthong /au/ (individual names).<sup>14</sup>

<sup>14</sup> The total number of responses by Japanese subjects for the name 'Kristján' in this table is 8, rather than 9, because one of the subjects did not choose any of the options.

### 3.3 Treatment of the nasal release of [t] and [d]

4 tokens: *Árni*, *Birna*, *Arnar*, *Arnór*

4 choices each: /-run-/, /-ruton-/, /-Qton-/, /-ruQton-/

Nasal release of [t] and [d] occurs in English in words such as *but-ton*, and *garden*, and involves a [t] (or [d]) sound, which is present also in the spelling of the words. This is inserted when transliterated into Japanese, i.e. [bo ta N], [ga a de N]. In the Icelandic nasal release, there is no ‘t’ in the spelling, even though the sound is similar to the English examples. Whether Icelandic and Japanese speakers will insert [t] in the Japanese pronunciation of these names or not remains to be seen. Since Japanese can have neither a consonant cluster CC, nor a consonant in the syllable final C#, and since V always follows C (except for geminate and syllabic nasals), the insertion of [t] also means the insertion of an additional vowel (normally [u] or [o]<sup>15</sup>), i.e. *Birna* → [bi ru **to** na]. In this experiment, the existence of the geminate ‘ㄿ’ is taken into consideration as well, thus giving four ways of pronouncing names with a nasal release in Japanese.

## Results

There is a clear preference among Icelandic subjects not to insert [t]. When [t] is inserted as a nasal release, a vowel [o] has to be inserted following [t] since consonant clusters are not allowed in Japanese. Icelandic speakers seem to avoid this double insertion. On the other hand, Japanese speakers prefer /ton/ or /Qton/, both of which involve inserted [t] and [o]. Of the four Japanese subjects who chose the type without [t] like the Icelanders, two had never been to Iceland and did not know the language. No Icelandic subject inserted a geminate, whereas three of the Japanese did.

<sup>15</sup> According to the general transliteration rule, it is a vowel /u/ that is inserted after the consonant. However, since [tu] and [du] do not exist in original Japanese sound syllabaries, the vowel [o] is inserted in these instances, i.e. [to], and [do].

	1st year	2nd year	1st & 2nd year	Japanese
/run/	44	26	70	4
/ruton/	5	(5) 4	(10) 9	18
/Qton/	0	0	0	3
/ruQton/	2	(2) 1	(4) 3	11

Table 3.a Choice of pronunciation for names that contain a nasal release [t<sup>n</sup>].

The individual results show the same tendency. The Japanese subjects preferred to insert [to], whereas Icelandic subjects did not.

	1st year	2nd year	1 <sup>st</sup> & 2nd year	Japanese
Árni				
アルニ [a ru ni]	12	8	20	1
アルトニ [a ru to ni]	0	0	0	5
アットニ [a t to ni]	0	0	0	0
アルットニ [a ru t to ni]	1	0	1	3
Birna				
ビルナ [bi run a]	12	8	20	2
ビルトナ [bi ru to na]	0	0	0	2
ビットナ [bi t to na]	0	0	0	2
ビルットナ [bi ru t to na]	1	0	1	3
Arnar				
アルナル [a ru na ru]	10	4	14	1
アルトナル [a ru to na ru]	2	3	5	6
アットナル [a t to na ru]	0	0	0	0
アルットナル [a ru t to na ru]	0	1	1	2
Arnór				
アルノル [a ru no ru]	10	6	16	0
アルトノル [a ru to no ru]	3	(2) 1	5	5
アットノル [a t to no ru]	0	0	0	1
アルットノル [a ru t to no ru]	0	(1) 0	1	3

Table 3.b Choice of pronunciation for names that contain a nasal release [t<sup>n</sup>] (individual names).

### 3.4 Treatment of the lateral release ([t<sup>l</sup>] ([d<sup>l</sup>]))

6 tokens: *Bolli, Halla, Erla, Páll, Porkell, Karl*

4 choices: /-to-/, /-Q-/, /-Qto-/, /-#-/

As with the nasal release, the lateral release also exists in English. It is transcribed [t<sup>l</sup>] or [d<sup>l</sup>], as in the words *bottle, middle*, and is transliterated [bo **to** ru] and [mi **do** ru] in Japanese. ‘t’ and ‘d’ occur in the spelling, too. In Icelandic names, ‘t’ and ‘d’ do not appear in the spelling, and it remains to be seen whether Japanese and Icelandic speakers include [t] and [d] sounds in the Japanese pronunciation of these Icelandic names. Even though the lateral release does not exist in Japanese, it does exist in transliterated words from English. Therefore, Japanese subjects are likely to insert [t] in Icelandic words, as they do for English ones, regardless of the fact that ‘t’ does not occur in the spelling. Once again, as a CC sequence is not possible in Japanese, a vowel has to be inserted after each consonant. Therefore, [t] and [d] will become [to] and [do], in Japanese pronunciation, i.e. *Bolli* → [bo **to** ri]. Here, also, the use of geminate /Q/ is taken into consideration, yielding four possible pronunciations per name.

## Results

Unlike with the nasal release [t<sup>n</sup>], no clear tendency could be observed for words with the lateral release [t<sup>l</sup>]. As Table 4.a shows, every pattern was chosen at least a few times, and no possible option was altogether rejected. In every subject group, however, /#/ (nothing inserted where there is a lateral release) was the least popular choice. Japanese subjects showed a preference for the insertion of a geminate /Q/. Interestingly, although the Icelandic subjects most commonly chose /#/ in the nasal release [t<sup>n</sup>], with [t<sup>l</sup>] there were several that chose to insert /Q/. Quite a number also inserted [to]. This implies that when names are transliterated so as to follow the original pronunciation closely, names with a nasal release such as *Birna* should be rendered /bi ru na/ without insertion of [to] or [tto] (/Qto/), whereas names such as *Erla*, should be transliterated /e ru to ra/ or /e ru Q ra/ or /e ru Q to ra/, but not /e ru ra/.

The difference in the results for nasal versus lateral release may be simply due to the fact that the two types of plosives have a very different place of closure. With the nasal release, the compressed air escapes through the nasal passage, which is opened by the lowering of the soft palate. The lateral release, on the other hand, is achieved by lowering one or both sides of the tongue to allow the air to escape, causing plosion followed by a friction, while the tongue-tip maintains its alveolar contact.<sup>16</sup> Thus, the lateral release is closer to alveolar plosive [t], as it has oral plosion and alveolar contact. In contrast, the plosion for the nasal release is made nasally, not orally. The lateral release [t<sup>l</sup>] is evidently perceived as a more disruptive sound than [t<sup>n</sup>], giving test subjects the impression that it requires an insertion, in a way [t<sup>n</sup>] does not.

	1st year	2nd year	1st & 2nd year	Japanese
/#/	10	7	17	4
/to/	16	18	34	8
/Q/	25	(12) 11	(37) 36	14
/Qto/	21	(12) 11	(33) 32	25

Table 4.a Choice of pronunciation for names that contain a lateral release [t<sup>l</sup>].

When the individual names in Table 4.b are considered, some trends become apparent. Table 4.a shows four cases in which Japanese subjects did not choose insertion /#/ . Table 4.b reveals that all of these concern the two names, *Páll* and *Borkell*, where the lateral release comes in word final position. If we exclude the three names, *Borkell*, *Páll*, and *Karl*, which have the lateral release in the final position, the preference is still divided, but the tendency among Icelandic subjects to choose either /to/ or /Q/, or both, grows stronger. A stronger tendency among Japanese subjects to insert both /Q/ and /to/ appears as well. The sound [t<sup>l</sup>] does not exist in Japanese and in order to pronounce it according to Japanese phonological rules, one of three possibilities exists: to insert a vowel between [t] and [l], to change the sound into a geminate /Q/, or to omit [t], in order to avoid a consonant cluster. When the sound occurs in word-final position, a vowel such as [u] must be added after [l], as Japanese words cannot end with

<sup>16</sup> Alfred C. Gimson, *An Introduction to the Pronunciation of English*, London: Edward Arnold, 1989, pp. 159–160.

a consonant, e.g. [so o ru ke to ru]. This makes it even more difficult to decide on a pronunciation that will follow Japanese phonological rules and still resemble the original sound. On the whole, it may be said that both Japanese and Icelandic speakers tend to insert either /Q/, or [to], or both. The tendency differs from name to name, but

	1st year	2nd year	1st & 2nd year	Japanese
<b>Bolli</b>				
ボリ [bo ri]	0	0	0	0
ボトリ [bo to ri]	3	5	8	0
ボッリ [bo ʔ ri]	7	2	9	0
ボットリ [bo t to ri]	3	1	4	9
<b>Halla</b>				
ハラ [ha ra]	1	1	2	0
ハトラ [ha to ra]	1	2	3	0
ハッラ [ha ʔ ra]	2	(3) 2	(5) 4	2
ハットラ [ha t to ra]	9	(3) 2	(12) 11	7
<b>Erla</b>				
エルラ [e ru ra]	3	0	3	0
エルトラ [e ru to ra]	5	5	10	2
エルッラ [e ru ʔ ra]	3	2	5	1
エルットラ [e ru t to ra]	2	1	3	5
<b>Páll</b>				
パル [pa ru]	5	3	8	2
パトル [pa to ru]	4	4	8	1
パッル [pa ʔ ru]	4	1	5	3
パットル [pa t to ru]	0	0	0	1
<b>Borkell</b>				
ソールケル [so o ru ke ru]	1	2	3	2
ソールケトル [so o ru ke to ru]	2	0	2	2
ソールケッル [so o ru ke ʔ ru]	6	3	9	4
ソールケットル [so o ru ke t to ru]	4	3	7	1
<b>Karl</b>				
カルル [ka ru ru]	0	1	1	0
カルトル [ka ru to ru]	1	2	3	3
カルッル [ka ru ʔ ru]	3	1	4	4
カルットル [ka ru t to ru]	3	4	7	2

Table 4.b Choice of pronunciation for names that contain a lateral release [t<sup>l</sup>] (individual names).

given the same name, both Japanese and Icelandic speakers tend to show similar preferences.<sup>17</sup>

### 3.5 The length of the vowel in an accented syllable

13 tokens: *Dagur, Elín, Eva, Gísli, Íris, Ívar, Jóhann, Ólafur, Saga, Úlfhildur, Þór, Kristín, Hjördís*

2 choices: /V/, /VV/ (/VR/)

The accented syllable tends to be pronounced more strongly and for longer in Icelandic. The vowel of the accented syllable sounds longer, but it is uncertain whether or not the lengthening of the vowel will be actually perceived and transliterated as one extra mora beat in Japanese. The latter part of a long vowel /R/ in Japanese consists of one mora, and makes a phonemic contrast, e.g. [o ba a sa N] = *grandmother*, [o ba sa N] = *aunt*. This is one of the difficult language characteristics for learners of Japanese to acquire.

## Results

As Table 5.a shows, both Japanese and Icelandic subjects show a preference for doubling vowel length in an accented syllable with an extra mora.

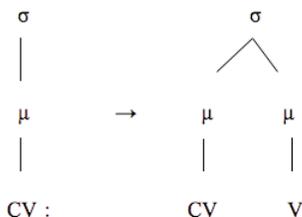


Figure 3. Change in the number of moras in an accented syllable of Icelandic (transliterating from an Icelandic long vowel to two Japanese monophthongs)

	1st year	2nd year	1st & 2nd year	Japanese
/V/	73	48	121	43
/VR/ (/VV/)	94	55	149	72

Table 5.a Choice of the pronunciation for the names that contain a vowel in an accented syllable.

<sup>17</sup> It should be noted that names such as *Erla* and *Karl*, which have ‘r’ preceding the sound in question, could be treated separately. However, from the data above, no clear tendency is observed for these names.

	1st year	2nd year	1st & 2nd year	Japanese
Dagur				
ダグル [da gu ru]	7	2	9	1
ダーグル [da a gu ru]	6	6	12	8
Elin				
エリン [e ri N]	9	6	15	6
エーリン [e e ri N]	4	2	6	3
Eva				
エヴァ [e ba]	4	6	10	2
エーヴァ [e e ba]	9	2	11	7
Gísli				
ギスリ [gi su ri]	11	6	17	7
ギースリ [gi i su ri]	2	1	3	1
Íris				
イリス [i ri su]	6	4	10	1
イーリス [i i ri su]	6	4	10	8
Ívar				
イヴァル [i ba ru]	2	2	4	0
イーヴァル [i i ba ru]	11	6	17	9
Jóhann				
ヨハン [jo ha N]	3	1	4	1
ヨーハン [jo o ha N]	10	7	17	8
Ólafur				
オラブル [o ra bu ru]	4	5	9	1
オーラブル [o o ra bu ru]	9	3	12	8
Saga				
サガ [sa ga]	1	2	3	0
サーガ [sa a ga]	12	6	18	9
Úlfhildur				
ウルブヒルドウル [u ru bu hi ru du ru]	9	6	15	7
ウールブヒルドウル [u u ru bu hi ru du ru]	4	2	6	1
Þór				
ソル [so ru]	1	2	3	1
ソール [so o ru]	11	6	17	8
Kristín				
クリスティン [ku ri su ti N]	8	2	10	8
クリスティーン [ku ri su ti i N]	5	6	11	1
Hjördís				
ヒョルディス [ço ru di su]	8	4	12	8
ヒョルディース [ço ru di i su]	5	4	9	1

Table 5.b Choice of pronunciation for names that contain a vowel in an accented syllable - (individual names).

The preference varies according to the name, although there are strong tendencies within the same name among Japanese subjects. *Úlfhildur* is made up of two names and is rather long, and both Japanese and Icelandic subjects chose not to lengthen the initial stressed vowel. For most other names, except *Gísli* and *Elín*, Japanese subjects tended to choose a longer version. For *Saga* and *Ívar*, all subjects chose /VR/, inserting an extra mora for the vowel.<sup>18</sup>

### 3.6 Treatment of an unaspirated plosive (voiced or voiceless).

10 tokens: *Dagmar*, *Birta*, *Bergur*, *Gísli*, *Hjördís*, *Bergur*, *Helgi*, *Ragnheiður*, *Ragnar*, *Sindri*

2 choices : voiced, voiceless

Japanese plosives may be either voiced or voiceless, whereas Icelandic plosives are categorized by aspiration. According to Pind, the perceptual boundaries of VOT (*voice onset time*) in aspirated and unaspirated Icelandic plosives occur at around 33 msec to 40 msec, depending on the place of articulation and speech rate.<sup>19</sup> On the other hand, the voiced alveolar plosive in Japanese has around -35 msec VOT, with a voiceless counterpart of around 30 msec VOT.<sup>20</sup> The VOT in Japanese voiceless plosives lies around the VOT boundary of aspirated and unaspirated plosives in Icelandic. What is unaspirated in Icelandic might sound like a voiceless plosive to Japanese speakers. Whether Japanese and Icelandic subjects would categorize unaspirated Icelandic plosives as voiced or voiceless Japanese plosives remains to be seen. The ten names listed above contain the sound in question either in the word-initial or the word-medial position.

<sup>18</sup> It was brought to my attention after the experiment that the vowel in the first syllable is short in *Gísli*, *Úlfhildur*, *Kristín*, and *Hjördís*, but long in the other names. This can explain some of the tendency here, but not all. In future experiment, these two types should be treated separately.

<sup>19</sup> Jörgen Pind, "Rate-dependent Perception of Aspiration and Pre-aspiration in Icelandic", *The Quarterly Journal of Experimental Psychology*, 49(3)/1996, pp. 745-764, here p. 752.

<sup>20</sup> 本間弥生、"二つの言語が干渉するとき—英語破裂音の生成の場合"、*文学とことば—イギリスとアメリカ* 上野直蔵先生追悼論文集、木村俊夫他、東京：南雲堂、1986, pp. 525-535, here p. 526.

## Results

Both Japanese and Icelandic subjects seemed to prefer the voiced version, though about half also chose the voiceless version. Since Icelandic plosives are aspirated or unaspirated, rather than voiced and voiceless, Icelandic students of Japanese often have difficulty in perceiving and producing voiced and voiceless contrasting sounds in Japanese words. This could be the reason why Icelandic subjects do not show a clearer tendency here. For Japanese speakers on the other hand, Icelandic unaspirated plosives may not always be perceived as voiced plosives in Japanese due to the different boundaries in VOT.

	1st year	2nd year	1st & 2nd year	Japanese
Voiceless	44	30	74	22
Voiced	83	50	133	67

Table 6.a Choice of pronunciation for names that contain unaspirated plosives in Icelandic.

Individual results indicate that both Japanese and Icelandic subjects chose the voiced version of names such as *Dagmar*, *Birta*, *Gísli* and *Sindri*. For the initial consonant of *Bergur*, Japanese subjects chose the voiced version, but opinions were divided among Icelandic subjects. For *Helgi*, Icelandic subjects chose both voiceless and voiced versions, showing no clear preference. With *Hjördis* and *Ragnar*, more Icelandic subjects chose the voiceless version, whereas Japanese subjects preferred the voiced version.

Although in general, both Japanese and Icelandic subjects chose the voiced version, results vary depending on the individual names and seem rather inconsistent. No special tendency could be observed with respect to the environment of the sound in question. (For example, VOT is known to be sensitive to the place of articulation and the vowel that follows it.) The reason for this inconsistency could be linked to the recording quality or the way the Icelandic name is read by the speaker each time. VOT can vary considerably according to individuals, too.

	1st year	2nd year	1st & 2nd year	Japanese
Dagmar				
タグマル [ta gu ma ru]	0	1	1	1
ダグマル [da gu ma ru]	13	7	20	8
Birta				
ピルタ [pi ru ta]	2	1	3	1
ビルタ [bi ru ta]	11	7	18	8
Bergur				
ベルグル [pe ru gu ru]	5	6	11	1
ベルグル [be ru gu ru]	8	2	10	8
Gisli				
キスリ [ki su ri]	0	1	1	1
ギスリ [gi su ri]	11	7	18	7
Hjördis				
ヒョルティス [çu ru ti su]	9	5	14	2
ヒョルティス [çu ru di su]	4	3	7	7
Bergur				
ベルクル [be ru ku ru]	3	2	5	3
ベルグル [be ru gu ru]	10	6	16	6
Helgi				
ヘルキ [he ru ki]	9	1	10	3
ヘルギ [he ru gi]	4	7	11	6
Ragnheiður				
ラクンヘイズル [ra ku N he i zu ru] <sup>21</sup>	2	2	4	5
ラグンヘイズル [ra gu N he i zu ru]	10	6	16	4
Ragnar				
ラクナル [ra ku na ru]	10	8	18	3
ラグナル [ra gu na ru]	3	0	3	6
Sindri				
シントリ [çi n to ri]	4	3	7	2
シンドリ [çi n do ri]	9	5	14	7

Table 6 b. Choice of pronunciation for names that contain unaspirated plosives in Icelandic - (individual names).

<sup>21</sup> /N/ is a phonemic symbol for moraic nasal in Japanese, representing the allophones [m], [n], [ɲ], [ŋ], [N], and nasalized vowels. [N], as an IPA phonetic symbol, is a uvular nasal. Throughout this paper, broad phonetic transcription is used and all the moraic nasals are transcribed with [N], which makes it easier to follow the argument.

### 3.7 Treatment of Icelandic dental fricatives [q], [ð]

13 tokens: *Þór, Þórir, Þóra, Þuríður, Þrúður, Ragnheiður, Davíð, Friðfínnur, Garðar, Guðrún, Hafliði, Guðmundur, Gyrðir*

2 choices: [θ], [ð] → [s], [z] or [θ], [ð] → [t] [d]

Dental fricatives exist in English, but the way they are transliterated into Japanese is not consistent. ‘Th’ is usually pronounced [s] in Japanese, but in some of the newer loan words, [t] is used, e.g. *therapy* [se ra pi i], but *aromatherapy* [a ro ma te ra pi i]. One might assume that phonetic similarities would determine the choice of sounds used in transcription. [θ] and [ð] are dental fricatives, and [s] and [z] are alveolar fricatives.<sup>22</sup> The places of articulation are not very far apart and the two groups are both fricatives. Whereas [t] ([d]) are alveolar stops, [s] ([z]) seem closer to [θ] ([ð]), therefore it could be assumed that subjects would choose [s] ([z]) for the transliteration. From the point of view of speech perception as well, [s] ([z]) are closer to [θ] ([ð]) than to [t] ([d]). Figure 1 shows Johnson’s perceptual map of fricatives and [d] in English.<sup>23</sup> However, auditory/perceptual similarity is not always the only factor driving the alternation of a sound. As Johnson points out, *this* and *that* may be mispronounced [θ] – [ð] and [ð] – [z], but not [ð] – [v], though [v] is closer to the original sound [ð] on the perceptual map than either [d] or [z].<sup>24</sup>

This study examines the choices made by Icelandic and Japanese speakers between the fricatives [s] ([z]) and plosives [t] ([d]), as alternative sounds to the original [θ] ([ð]). It also observes whether the choice is affected by environment, e.g. the types of vowels that follow.

<sup>22</sup> It is said that there are two ways of articulating [s] by native speakers of Icelandic, one with the tip of the tongue nearing the alveolar ridge, and the other with the tip of the tongue behind the lower front teeth with the result that a stricture is formed by the blade of the tongue against the alveolar ridge. Kristján Árnason, “Atkvæðagerð, hljóðskipun og lengd”, p. 16; Eiríkur Rögnvaldsson, *Íslensk hljóðfræði. Kennslukver handa nemendum á háskólastigi*, Reykjavík: Málvísindastofnun Háskóla Íslands, 1989, p. 30. (I would like to express my gratitude to Eiríkur Rögnvaldsson and Magnús Sigurðsson for verifying the content of the Icelandic sources cited.)

<sup>23</sup> Keith Johnson, *Acoustic & Auditory Phonetics*, Oxford: Blackwell Publishing, 2nd edition, 2003, p. 69. (The perceptual map is based on the confusion matrix where the number of times each sound is mistaken for another is counted. The number of times a sound is confused with another is calculated into the degree of similarity by ratio, and then into the perceptual distance.)

<sup>24</sup> *Ibid.*, pp. 59–71.

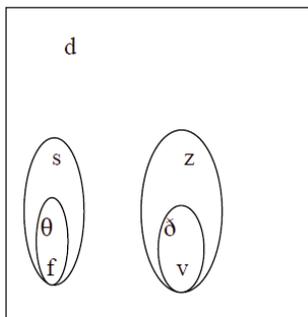


Figure 2. Perceptual map of fricatives and [d] in English. Keith Johnson, *Acoustic & Auditory Phonetics*, p. 69.

## Results

Dental/alveolar fricatives appear frequently in Icelandic proper names. Both Japanese and Icelandic subjects seemed to prefer alveolar fricatives [s], [z], to plosives [t], [d] in transliterating the sound.

	1st year	2nd year	1st & 2nd year	Japanese
[s] / [z]	117	79	196	84
[t] / [d]	52	25	77	30

Table 7.a Choice of pronunciation for names that contain dental fricatives [θ], [ð].

There were, however, some differences depending on the environment in which the sound occurred. When the sound was in word-final position (*Davíð*)<sup>25</sup>, or followed by a consonant (*Þríður*, *Friðfinnur*, *Guðrún*, *Guðmundur*), the preference was for the sound to be replaced by fricatives /s/, /z/. When the sound was followed by vowels such as [ou]<sup>26</sup> (*Þór*, *Þórir*, *Þóra*) or [ʏ]<sup>27</sup> (*Þuríður*), the fricative version was preferred ([s]). [su] is found in the original Japanese syllabaries, whereas [tu] is not. Except for the name *Ragnheiður*, whose dental fricative is followed by [ʏ], and is

<sup>25</sup> Where the sound is often devoiced in final position.

<sup>26</sup> [ou] would be transliterated [oo] in Japanese.

<sup>27</sup> [ʏ] would be transliterated [uu] in Japanese.

	1st year	2nd year	1st & 2nd year	Japanese
Þór				
ソール [so o ru]	10	7	17	8
トール [to o ru]	3	1	4	1
Þórir				
ソーリル [so o ri ru]	10	8	18	8
トーリル [to o ri ru]	3	0	3	1
Þóra				
ソーラ [so o ra]	11	8	19	9
トーラ [to o ra]	2	0	2	0
Þuríður				
スーリズル [su u ri zu ru]	13	8	21	7
トーリズル [to o ri zu ru]	0	0	0	2
Þrúður				
スルーズル [su ru u zu ru]	12	8	20	9
トルーズル [to ru u zu ru]	1	0	1	0
Ragnheiður				
ラグンヘイズル [ra gu N he i zu ru]	6	4	10	3
ラグンヘイドル [ra gu N he i do ru]	7	4	11	5
David				
ダビーズ [da bi i zu]	13	8	21	8
ダビード [da bi i do]	0	0	0	0
Friðfinnur				
フリスフィンヌル [fʰu ri zu fi N nu ru]	13	8	21	6
フリドフィンヌル [fʰu ri do fi N nu ru]	0	0	0	3
Garðar				
ガルザル [ga ru za ru]	5	4	9	7
ガルダル [ga ru da ru]	8	4	12	2
Guðrún				
グズルン [gu zu ru N]	13	8	21	8
グドルン [gu do ru N]	0	0	0	1
Haflíði				
ハブリジ [ha bu ri zi]	0	0	0	3
ハブリディ [ha bu ri di]	13	8	21	5
Guðmundur				
グズムンドウル [gu zu mu N du ru]	11	7	18	5
グドウムンドウル [gu do mu N du ru]	2	1	3	4
Gyðir				
ギルジル [gi ru zi ru]	0	1	1	3
ギルディル [gi ru di ru]	13	7	20	6

Table 7.b Choice of pronunciation for names that contain dental fricatives /θ/, /ð/ (individual names).

transliterated [u] in Japanese, both Japanese and Icelandic subjects tended to chose [s] in order to avoid the [tu] sequence. On the other hand, when the sound was followed by [a] (*Garðar*) or [i] (*Haflíði*, *Gyrðir*), the plosive version was preferred ([t], [d]). The reason why [t] ([d]) should be preferred to [s] ([z]) before [a] and [i] is difficult to explain, and further study is needed. However, it may be relevant that, when [z] is followed by [i], it becomes palatalized [ʒ] in Japanese. [ʒi] may not sound as close to the original pronunciation [ði] as [zi] in names such as *Haflíði*, and *Gyrðir*.

### 3.8 Vowel insertion for the Icelandic clusters, ‘hr’ / ‘hl’.

#### *The choice of the vowel after ‘h’.*

6 tokens: *Hlín*, *Hlynur*, *Hlíf*, *Hrönn*, *Hrannar*, *Hrafnhildur*

5 choices : [ha], [çi], [Φu], [he], [ho] (/ha/, /hi/, /hu/, /he/, /ho/)

When inserting a vowel into a consonant cluster in the process of transliteration, Japanese tends to use [o] rather than [u] after [t] and [d], since [tu] and [du] are not originally Japanese sounds, e.g. *cup* [ka p pu], but *cut* [ka t to]. However, the choice of vowels following voiceless glottal fricative /h/ can be tricky. Japanese syllabaries with /h/ are /ha/, /hi/, /hu/, /he/, /ho/, phonetically, [ha], [çi], [Φu], [he], [ho], which result in three allophones for the consonant /h/. Even though /u/ is a common choice for vowel insertion, the preceding consonant will also change from [h] to [Φ]. Consequently, it is uncertain whether subjects will consider the sound to be a closer approximation of the original.

The type of consonant that follows /h/ may also affect the choice of the vowel to be inserted. In /hl/, the tongue is already in preparation for the subsequent /l/ as /h/ is being pronounced, and is close to the position required for the vowel /i/, with the front part of the tongue raised towards the palate. For that reason, /i/ might be preferred to /u/ or /o/. On the other hand, when /h/ is accompanied by /r/, it could be pronounced with a slight lip-rounding, making it easier to pronounce /u/. It may therefore be predicted that subjects will choose different vowels to insert in the consonant clusters /hl/ and /hr/. This is one of the most problematic sounds to transliterate into Japanese. Whichever vowel is inserted, the outcome sounds quite different from the original pronunciation.

## Results

On the whole, both Japanese and Icelandic subjects preferred to have vowels /i/ or /u/ inserted after /h/. In Japanese, the phoneme /h/ has allophones [h], [ç], [Φ]: [h] before /a/, /e/, /o/, [ç] before /i/, and Φ before /u/. When an Icelandic word with /h/ followed by a consonant is transliterated into Japanese, a vowel has to be inserted. Depending on which vowel is used, the consonant /h/ itself will have to change, e.g. [h] → [ç]/\_i, and [h]→[Φ]/\_u. Even if inserting /i/ or /u/ led to more sound changes, they were still the preferred choice of vowels.

	1st year	2nd year	1st & 2nd year	Japanese
[ha]	8	(3) 2	(11) 10	3
[çi]	29	7	36	13
[φu]	28	(31) 30	(59) 58	25
[he]	4	3	7	6
[ho]	7	4	11	6

Table 8.a Choice of pronunciation for names that contain consonant clusters /hl/ or /hr/.

In looking at individual names, further tendencies may be observed. The vowel /i/ is inserted by preference when /h/ is followed by /l/ (*Hlín*, *Hlynur*, *Hlíf*), and when /h/ is followed by /r/ (*Hrönn*, *Hrannar*, *Hrafnhildur*). /u/ is the second most popular choice, followed by /a/ and /o/. With the name *Hlíf*, however, /i/ and /u/ are given almost equal preference. The Japanese subjects made similar choices for each name as the Icelandic ones, except for *Hlíf*, where none of the Japanese subjects chose /hu/, the most popular choice for Icelandic subjects. Instead, Japanese subjects preferred /ho/, or even /hi/ and /he/.

In this experiment, /hl/ and /hr/ are treated as consonant clusters. However, those are usually pronounced as unvoiced trills/laterals, although a short [h] is sometimes pronounced in the initial position. Therefore, in the future experiment, we should include the variables such as [ri N] for *Hlín*, [ro N] for *Hrönn* and [ra na ru] for *Hrannar* as well.

	1st year	2nd year	1st & 2nd year	Japanese
<b>Hlín</b>				
ハリン [ha ri N]	0	0	0	0
ヒリン [çi ri N]	11	2	13	5
フリン [φu ri N]	1	3	4	1
ヘリン [he ri N]	1	2	3	2
ホリン [ho ri N]	0	0	0	0
<b>Hlynur</b>				
ハリヌル [ha ri nu ru]	1	1	2	0
ヒリヌル [çi ri nu ru]	7	2	9	5
フリヌル [φu ri nu ru]	3	4	7	4
ヘリヌル [he ri nu ru]	2	1	3	0
ホリヌル [ho ri nu ru]	0	0	0	0
<b>Hrónn</b>				
ハロン [ha ro N]	0	0	0	0
ヒロン [çi ro N]	3	0	3	0
フロン [φu ro N]	8	8	16	6
ヘロン [he ro N]	0	0	0	1
ホロン [ho ro N]	2	0	2	2
<b>Hlíf</b>				
ハリフ [ha ri φu]	0	0	0	0
ヒリフ [çi ri φu]	7	2	9	3
フリフ [φu ri φu]	5	5	10	0
ヘリフ [he ri φu]	0	0	0	2
ホリフ [ho ri φu]	1	1	2	4
<b>Hrannar</b>				
ハラナル [ha ra na ru]	4	(2) 1	(6) 5	1
ヒラナル [çi ra na ru]	0	0	0	0
フラナル [φu ra na ru]	6	(5) 4	(11) 10	7
ヘラナル [he ra na ru]	1	0	1	1
ホラナル [ho ra na ru]	2	2	4	0
<b>Hrafnhildur</b>				
ハラップンヒルドゥル [ha ra p pu N çi ru du ru]	3	0	3	2
ヒラップンヒルドゥル [çi ra p pu N çi ru du ru]	1	1	2	0
フラップンヒルドゥル [φu ra p pu N çi ru du ru]	5	6	11	7
ヘラップンヒルドゥル [he ra p pu N çi ru du ru]	0	0	0	0
ホラップンヒルドゥル [ho ra p pu N çi ru du ru]	2	1	3	0

Table 8.b Choice of pronunciation for names that contain consonant clusters /hl/ or /hr/- (individual names).

## 4. Summary and Conclusions

For all eight types of sounds chosen for this experiment, certain tendencies could be observed, some clear and others less striking. In most cases, Icelandic and Japanese subjects showed similar tendencies. Case 1), geminate /Q/ insertion, and case 3), nasal release [t<sup>n</sup>] ([d<sup>n</sup>]), were the only ones for which Japanese and Icelandic subjects showed distinctly different preferences. The reason why only two out of eight types of sound yielded different results for Japanese and Icelandic subjects is unclear. Further analysis based on a larger amount of data for each type of sound is needed. In the case of geminate insertion, it has been shown that Japanese commonly adds a geminate to a consonant preceded by a short vowel in the process of transliteration. Thus, when words with a weak and closed syllable, i.e. /-CVC#/ , are transliterated into Japanese, the common tendency is for a vowel to be inserted at the syllable final, and the final consonant to become a geminate, i.e. /-CVQCV/. Therefore, with the Icelandic name such as *Diðrik* it is predictable that Japanese speakers will choose to transliterate the final syllable /-rik/ into /-riQku/. However, for Icelandic speakers, the moraic geminate /Q/ is a difficult sound to acquire, and indeed, first-year students did not seem to differentiate between pairs such as [di zu ri ku] and [di zu ri k ku]. Second-year students seemed to understand the difference, but considered the version without geminate to be closer to their native pronunciation. Their choice would then be explained by the fundamental difference in the syllable quantity of the two languages. In Icelandic, all syllables are heavy, unless unaccented and reduced to a weak syllable. Possible syllables in Icelandic are /V:/, /V:C/, /VC:/ (i.e. when the final consonant is a geminate) or /VCC/ (i.e. a consonant cluster). For example, in names such as *Didrik* or *Fridrik*, there are three possible ways to pronounce the syllable of the ‘-rik’ type:

- [ri(:)k] -k ‘rik’ with one final consonant
- [rihk] -hk ‘rikk’ with a double consonant, (preaspiration is so strong that it is worth one consonant, hence, /h/ and /k/ make a double consonant.)
- [rik:] -k: ‘rigg’ with a geminate at the end

The first option is the correct pronunciation: either of the others would sound odd, or even resemble completely different words, to the Icelandic speaker. This means that Icelandic requires the final consonant in this type of word to be short.<sup>28</sup> The choice of transliteration for this type of sound would thus seem to depend on whether one favours a pronunciation that seems more natural to Icelandic speakers or one best adapted to Japanese speakers.

For case 3), nasal release, the opinions of Japanese and Icelandic subjects diverged as well. Japanese subjects preferred to insert either [t] followed by [o], or a geminate /Q/, or both. Icelandic subjects chose not to insert anything. Either inserting a geminate /Q/ mora, a sound foreign to Icelandic speakers, or inserting [t] with [o] will alter the sound considerably to their ears. The Icelandic nasal release differs considerably from the English: in English, the nasal sound in words such as ‘button’ [bʌt̪n̩] and ‘garden’ [gɑːdn̩] is syllabic. Each word is a two-syllable word, and the consonant with the nasal release is always the onset of the following syllable. In contrast, the Icelandic nasal release does not form a syllable. A word such as ‘barn’ [bart̪n̩] (=child) is a one-syllable word. A name like *Birna* [birt̪na] is a two-syllable word, with [birt̪n̩] in the first syllable, and [a] in the second. The nasal release is thus shorter than in English, making a transliteration with inserted [t] and [o] even more unnatural to Icelandic speakers than to English speakers.<sup>29</sup> On the other hand, [t] accompanied by a vowel [o] is a natural process in transliteration in Japanese. Thus, Japanese and Icelandic speakers have different perceptions as to which is the closest approximation of names such as *Birna*: Japanese speakers would prefer [bi ru to na], whereas Icelandic speakers would choose [bi ru na].

Apart from these two categories, both Japanese and Icelandic subjects showed more or less the same tendencies. For 2), diphthong [au], as represented by the letter ‘á’ in Icelandic, both tend-

<sup>28</sup> This finding leads to an interesting question. A name such as *Rebekka* in Icelandic is pronounced [re:behka] with pre-aspiration, which is the same as the second type of ‘-rik’ realizations. The Japanese transliteration of this name would be /re be Q ka/ with a geminate, and in this case, Icelandic subjects might agree with Japanese subjects.

<sup>29</sup> This suggests a possible transliteration of /bi Q na/, using a geminate but without the insertion of /t/ and /o/. Although this is not truly representative of a natural Japanese pronunciation, Icelandic subjects might prefer this version due to its syllable quantity. This token should therefore be included in the next experiment.

ed to prefer either diphthong [au] or the two-vowel sequence [a] and [u], which orthographically are transcribed ‘アウ’ and ‘アウ’. Either choice will yield essentially the same result, as Japanese people normally pronounce both as a sequence of two vowels rather than as a diphthong. It should be noted, however, a name, *Álfrún*, showed a different result from this general trend. This is probably due to the fact that the diphthong [au] is pronounced shorter in *Álfrún* than in *Ágúst*.

For 4), lateral release, both Japanese and Icelandic speakers opted for the insertion of [to], /Q/ or both, geminate /Q/ being the most popular choice among Japanese speakers and Icelandic first-year students. It is difficult to decide which of the three options is most appropriately used in transliteration. The preference of the subjects seemed to vary with the names, and more names should be tested.

For 5), long vowel /R/, a slight tendency appeared for both Japanese and Icelandic speakers to prefer a long vowel /VR/ (/VV/), i.e. to have an extra mora with the lengthened vowel. Although the overall tendency is not striking, trends for each individual name showed up clearly and were similar for all three subject groups. In order to transliterate the original sound most accurately, the vowel in an accented syllable should be lengthened so as to add one mora, with some exceptions.

For 6), unaspirated plosives in Icelandic, a voiced pronunciation in Japanese proved more popular than an unvoiced alternative among both Japanese and Icelandic subjects, even though VOT in a voiceless plosive in Japanese is closest to VOT in Icelandic unaspirated plosives. The tendency varied considerably with individual names. The three subject groups tended to make the same choices for each individual name. This implies that subjects had consistent criteria with which to determine their choice. Perceptual cues for VOT in both Icelandic words and their Japanese transliterations should be studied in more detail.

For 7), dental fricatives [θ], [ð], the general tendency for both Japanese and Icelandic subjects was towards alveolar fricatives [s] and [z], rather than plosives [t] and [d], although again, the trend varied according to the environment. In general, [s] and [z] were preferred in word-final position (\_#), when the sound was followed

by a consonant (C), or the vowels [ou] or [ʏ] ([oo] or [uu] in transliteration). When followed by vowels [a] or [i], on the other hand, there seemed to be a preference towards plosives [t], [d]. Although these results need to be studied in greater detail, they suggest that names such as *Garðar* and *Gyrðir* would be transliterated [ga ru ða ru], [gi ru ði ru], whereas names such as *Davidð*, *Brúður*, *Þór*, and *Puríður* would be transliterated [da bi i zu], [su ru u zu ru], [so o ru], and [su u ri zu ru].

For 8), the vowel inserted in a consonant cluster /hC/, both Japanese and Icelandic subjects chose [u] or [i]. The general tendency seemed to be for /u/ to be inserted when the following consonant was [r], and for [i] to be preferred before [l]. In both cases, the /h/ [h] changes into its allophones before these two vowels in Japanese, i.e. [h]→[ç]/i, [h]→[Φ]/u. However, the tendency is not very striking, and the pronunciation of the names changes greatly from the original in either case. Personal preferences based on the overall sound of the name may have affected the choices in this case.

A more detailed analysis is needed based on a larger data sample, especially for those instances in which Japanese and Icelandic subjects showed divergent tendencies. Names that did not follow the trends outlined in the test results should also be examined further. Transliterating Icelandic proper nouns into Japanese is a challenging task. There are inconsistencies in both orthography and pronunciation, and multiple possibilities to be considered in the transliteration process. This study has focused on the closest approximation to the pronunciation of certain words, and attempted to establish some general tendencies.

Although Japanese and Icelandic subjects appeared to process the sounds of both languages in somewhat different ways, the overall results of the experiment reflected common trends for both. Nonetheless, cross-linguistic differences evidently affected the choice of words in some cases, and these instances need to be examined more closely in the future.

Appendix<sup>30</sup>

Phonetic and phonemic transcription by the author.

Reference: Shigeko Imada, *Pronunciation*, Tokyo: Bonjinsha, 1989, pp. 25–87.)<sup>31</sup>

Some of the phonemic transcriptions in Table I are replaced by phonetic symbols in order to differentiate them from some of the more foreign *Katakana* sounds in Table 2.

Table I: *Katakana* syllabary commonly used to transcribe loan words, foreign place/people names.

(Both phonemic transcription / / and phonetic transcription [ ] by the author.

/N/, /Q/, and /R/, in phonemic transcription only because of the presence of many allophones.)

ア	イ	ウ	エ	オ
/a/ [a]	/i/ [i]	/u/ [u]	/e/ [e]	/o/ [o]
カ	キ	ク	ケ	コ
/ka/ [ka]	/ki/ [k <sup>j</sup> i]	/ku/ [ku]	/ke/ [ke]	/ko/ [ko]
サ	シ	ス	セ	ソ
/sa/ [sa]	/ʃi/ [çi]	/su/ [sʊ]	/se/ [se]	/so/ [so]
タ	チ	ツ	テ	ト
/ta/ [ta]	/tʃi/ [tçi]	/tsu/ [tsʊ]	/te/ [te]	/to/ [to]
ナ	ニ	ヌ	ネ	ノ
/na/ [na]	/ni/ [ni]	/nu/ [nu]	/ne/ [ne]	/no/ [no]
ハ	ヒ	フ	ヘ	ホ
/ha/ [ha]	/hi/ [çi]	/hu/ [φu]	/he/ [he]	/ho/ [ho]
マ	ミ	ム	メ	モ
/ma/ [ma]	/mi/ [m <sup>j</sup> i]	/mu/ [mu]	/me/ [me]	/mo/ [mo]
ヤ		ユ		ヨ
/ja/ [ja]		/ju/ [ju]		/jo/ [jo]
ラ	リ	ル	レ	ロ
/ra/ [ra]	/ri/ [r <sup>j</sup> i]	/ru/ [ru]	/re/ [re]	/ro/ [ro]
ワ				
/wa/ [wa]				
ガ	ギ	グ	ゲ	ゴ
/ga/ [ga]	/gi/ [g <sup>j</sup> i]	/gu/ [gu]	/ge/ [ge]	/go/ [go]

Continued →

30 五味敏雄（代表）、*Sanseido's Concise Dictionary of Katakana Words*, Tokyo: Sanseido Co., 2005, pp. 1417–1424.

31 今田滋子、*発音*、東京：凡人社、1989, pp. 25–87.

ザ	ジ	ズ	ゼ	ゾ
/za/ [za]	/zi/ [ʒɪ] [dʒi]	/zu/ [zʊ]	/ze/ [ze]	/zo/ [zo]
ダ			デ	ド
/da/ [da]			/de/ [de]	/do/ [do]
バ	ビ	ブ	ベ	ボ
/ba/ [ba]	/bi/ [bʲi]	/bu/ [bʊ]	/be/ [be]	/bo/ [bo]
パ	ピ	プ	ペ	ポ
/pa/ [pa]	/pi/ [pʲi]	/pu/ [pʊ]	/pe/ [pe]	/po/ [po]
キャ		キュ		キョ
/kja/ [kʲa]		/kju/ [kʲʊ]		/kjo/ [kʲo]
シャ		シュ		ショ
/ʃa/ [ʃa]		/ʃu/ [ʃʊ]		/ʃo/ [ʃo]
チャ		チュ		チョ
/tʃa/ [tʃa]		/tʃu/ [tʃʊ]		/tʃo/ [tʃo]
ニャ		ニユ		ニョ
/nja/ [nja]		/nju/ [nju]		/njo/ [njo]
ヒャ		ヒユ		ヒョ
/hja/ [ça]		/hju/ [çʊ]		/hjo/ [ço]
ミャ		ミユ		ミョ
/mja/ [mʲa]		/mju/ [mʲʊ]		/mjo/ [mʲo]
リャ		リュ		リョ
/rja/ [rʲa]		/rju/ [rʲʊ]		/rjo/ [rʲo]
ギャ		ギユ		ギョ
/gja/ [gʲa]		/gju/ [gʲʊ]		/gjo/ [gʲo]
ジャ		ジュ		ジョ
/zja/ [ʒa] [dʒa]		/zju/ [zʊ] [dʒʊ]		/zjo/ [zo] [dʒo]
ビャ		ビユ		ビョ
/bjja/ [bʲa]		/bjju/ [bʲʊ]		/bjjo/ [bʲo]
ピャ		ピユ		ピョ
/pjja/ [pʲa]		/pjju/ [pʲʊ]		/pjjo/ [pʲo]
ン				
/N/				
ツ				
/Q/				
ー				
/R/				

			シエ	
			/sje/[ɕe]	
			チエ	
			/tje/[tɕe]	
ツァ			ツエ	ツォ
/tʂa/[tʂa]			/tʂe/[tʂe]	/tʂo/[tʂo]
	テイ			
	/tʂi/[tʂi]			
ファ	フィ		フェ	フォ
/fa/[ɸa]	/fi/[ɸi]		/fe/[ɸe]	/fo/[ɸo]
			ジェ	
			/zje/[dʒe]	
	ディ			
	/dʒi/[di]			
		デュ		
		/dʒu/[dʒu]		

Table II: *Katakana* syllabary used to transcribe loan words, foreign place/people names closer to the original pronunciation, (with phonemic and phonetic transcriptions by the author)

			イエ	
			/je/[je]	
	ウィ		ウエ	ウォ
	/wi/[wi]		/we/[we]	/wo/[wo]
クァ	クィ		クェ	クォ
/kwa/[kʷa]	/kwi/[kʷi]		/kwe/[kʷe]	/kwo/[kʷo]
	ツイ			
	/tʂi/[tʂi]			
		トゥ		
		/tu/[tu]		
グァ				
/gwa/[gʷa]				
		ドゥ		
		/du/[du]		
ヴァ	ヴィ	ヴ	ヴェ	ヴォ
/va/[va]	/vi/[vi]	/vu/[vu]	/ve/[ve]	/vo/[vo]
		テュ		
		/tʂu/[tʂu]		
		フュ		
		/fʂu/[ɸʂu]		
		ヴュ		
		/vʂu/[vʂu]		

## ÚTDRÁTTUR

Umritun íslenskra nafna á japönsku  
samkvæmt *Katakana*-ritkerfi  
Könnunarrannsókn

Markmið þessarar rannsóknar er að kanna hver þeirra aðferða sem til greina koma við umritun íslenskra mannanafna á japönsku komist næst því að skila íslenskum framburði nafnanna að mati þátttakenda í rannsókninni.

Í rannsókninni eru greind átta mismunandi hljóð sem eru án samsvörunar milli tungumálanna og gerð grein fyrir viðbrögðum þátttakenda, sem höfðu ýmist íslensku eða japönsku að móðurmáli, við mismunandi lausnum. Þrír hópar, Íslendingar á fyrsta ári í japönskunámi, Íslendingar á öðru ári í japönskunámi og fólk með japönsku að móðurmáli, voru beðnir að hlusta á hljóðupptöku af nokkrum mögulegum umritunum og velja þá útgáfu sem þeir töldu að kæmist næst upprunalegum íslenskum framburði. Heildarniðurstaða tilraunarinnar er sú að sömu tilhneigingar gætti hjá bæði japönsku og íslensku þátttakendunum varðandi allar þessar átta gerðir af hljóðum. Augljóst var þó að munur milli tungumálanna hafði áhrif á val orða í einhverjum tilvikum. Þörf er á nánari greiningu, byggðri á stærra úrtaki gagna, einkum í þeim dæmum þar sem Japanir og Íslendingar hneigðust í mismunandi áttir. Gera þyrfti frekari athuganir á þeim nöfnum þar sem útkoman féll ekki að meginniðurstöðu rannsóknarinnar.

## ABSTRACT

Transliterating Icelandic Names into  
Japanese *Katakana* Words  
An Exploratory Study

This study aims to discover which of several possible ways of transcribing Icelandic personal names into Japanese will come closest to the original Icelandic pronunciation in the subjects' estimation.

It identifies and examines eight discrete mismatches of sound between Japanese and Icelandic and reports on a survey of Icelandic and

Japanese speakers' response to various solutions. Three groups of subjects, Icelandic first-year students of Japanese, Icelandic second-year students of Japanese, and Japanese native speakers, were asked to listen to a recording of several possible transliterations and choose the version that they thought approximated the original Icelandic pronunciation most closely. The overall results of the experiment show common trends for both Japanese and Icelandic subjects in each of the eight types of sound. Nonetheless, cross-linguistic differences evidently affected the word choice in some cases. A more detailed analysis is needed, based on a larger data sample, especially for those instances in which Japanese and Icelandic subjects showed divergent tendencies. Names that did not follow the trends outlined in the test results should also be examined further.