

Washing the TV: The Curious Case of the
Voiceless Affricate in the L2 English of Native
Swedish Speakers

MA Thesis

Rosan Esther Surman

Student number: 10025251

Supervisor: Dr. S. R. Hamann

MA Language and Society (Linguistics)

University of Amsterdam

Preface

One day, when I was speaking with one of my Swedish friends, with whom I converse in English, I noticed something odd about the way he pronounced a certain word. He, a software engineer himself, was telling me that he had attended a super high-tech security convention where all the ‘sheefs’ had been present. As I know nothing about high-tech software engineering, I was trying very hard to work out what my friend could mean with ‘sheefs’, and I wondered whether a ‘sheef’ was some kind of security device, or an abbreviation for a special kind of software engineer. When my friend continued his story, telling me that he had enjoyed a bourbon and a cigar with the head-sheef, I stopped him and asked what the hell a ‘sheef’ was. Rather surprised he answered: “You know, a sheef, the sheef of police...”. Understanding now what my friend had been on about I corrected his pronunciation (“Ah, you mean CHIEF”), to which he replied quite indignantly that that was what he had said. Later on, when I caught him pronouncing a fricative for an affricate again, he admitted that he had difficulties pronouncing the English affricate, but also that he was not the only Swedish person to have this difficulty. My interest was peaked and I decided to investigate. The research that I present is the result of that investigation.

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Table of Contents

1. Introduction.....	1
2. Background.....	2
2.1. A Foreign Accent and the Relation between Perception and Production.....	2
2.2. Comparison of English and Swedish Consonants.....	3
2.3. The Perception of English in a Native Swedish Context.....	4
2.4. The Production of English in a Native Swedish Context.....	5
2.5. Level of Attention to Speech, and Articulatory Effort in Production.....	6
3. Research Questions and Hypotheses.....	6
3.1. Research Question 1.....	6
3.2. Research Question 2.....	7
4. Methodology.....	8
4.1. Materials and Procedure.....	8
4.2. Participants.....	10
5. Results and Analysis.....	11
5.1. General Results and Analysis.....	11
5.2. Results and Analysis of the Voiceless Affricate in Onset and Coda Position...	13
5.3. Male versus Female Participants.....	14
6. Discussion.....	14
6.1. General Discussion in Light of H1 and H11.....	14
6.2. Male versus Female Participants.....	16
6.3. Participant B: Is a Phonetic Category in Place.....	16
6.4. Participant J.....	17
6.5. Participant O.....	18
6.6 Participant G: High Level of Linguistic Awareness.....	18
7. Conclusion.....	19
8. Limitations and Further Research.....	20
- References.....	21
- Appendices.....	23

Introduction

Within Europe the Swedish people make up one of the biggest groups that speak English as a second language. English is not only taught and spoken every day in Swedish education but also used in academia, media and everyday life in Sweden (Bolton and Meierkord 2013: 94). English has even become so prevalent in Sweden that concerns have been raised that English might be threatening the position of the Swedish language in Swedish society (Bolton and Meierkord 2013: 95). Whether this is the case or not it is safe to say that a lot of Swedish people speak a fair amount of English, and that most surpass the basic level of English comprehension and production. That being said it has come to my attention that the Swedish people that I have spoken English with pronounce a voiceless fricative [ʃ] where English requires a voiceless affricate [tʃ], such as [ʃi:p] ('sheep') for [tʃi:p] ('cheap'), [ʃɪp] ('ship') for [tʃɪp] ('chip'), [wɪʃ] ('wish') for [hwɪtʃ] ('which'). Furthermore, when affrication was produced where it is required in English, it was produced inconsistently by the same speaker. For example, one of my Swedish friends casually told me that he had nibbled on some [ʃɒklət], but also, in answer to what his favourite flavour of ice-cream is, he answered that it was [tʃɒklət]. As a result I was left asking why Swedish native speakers produce [ʃ] for /tʃ/ in English, and why, when they can produce [tʃ] where it is required, do they produce it inconsistently.

Not much research has been done on the issue that native Swedish speakers appear to have with affrication in English, and the research that does deal with this issue only acknowledges it and does not give an explanation for the lack of - or variance in - the use of the voiceless affricate in the L2 English of native Swedish speakers (Eklund and Lindström 1998, Jerving 2015, Reinholdsson 2013). In effort to shed light on the apparent difficulty that native Swedish speakers have with the production of the English affricate, and the variance in production of this affricate when it is produced in their L2 English, this thesis aims to answer the following questions:

Q1: Is there and what is a phonetic explanation for the difficulty that native Swedish speakers have in the production of the English voiceless affricate?

Q2: Is there and what is a phonetic explanation for the inconsistency in production of the voiceless affricate within the same native Swedish speaker, i.e. why a speaker produces the voiceless affricate successfully in the one situation, but not in the other?

2. Background

2.1. A Foreign Accent and the Relation between Perception and Production

Among other things, such as a different intonation and stress, the use of a fricative for an affricate contributes to the ‘foreign’ accent that Swedes have when speaking English. There are many theories about the cause of such a ‘foreign’ accent. Causes that are posed include an inadequate input of the second language, lack of motivation to learn the L2 perfectly, motor difficulties that influence the actual pronunciation, and perception of the L2. But “[m]ost importantly, bilinguals tend to interpret sounds encountered in an L2 through the “grid” of their L1 phonology” (Flege, 1995, 237). This means that learners of an L2 will initially always try, unconsciously, to match the sounds encountered in the L2 with the sounds that exist in their L1. Some scholars have even suggested that all “foreign consonants are judged to be realisations of an L1 consonant, or else are heard as non speech” (240). This is however refuted by the numerous studies on L2 production that provide “evidence that, over time, L2 learners take note in some way of cross-language phonetic differences” (240).

The Speech Learning Model (SLM), developed by Flege and colleagues (1995), poses seven hypotheses that aim to explain the (in)ability of L2 learners “to produce L2 vowels and consonants in a native-like fashion” (237). Although the SLM is focussed mainly the influence of the ‘age of learning’ (AOL) of the speaker’s L2, it is of interest for this research to look at the following two hypotheses posed in the SLM:

“H2: A new phonetic category can be established for an L2 sound that differs phonetically from the closest L1 sound if bilinguals discern at least some of the phonetic differences between L1 and L2 sounds.

H5: Category formation for an L2 sound may be blocked by the mechanism of equivalence classification. When this happens, a single phonetic category will be used to process perceptually linked L1 and L2 sounds (diaphones). Eventually, the diaphones will resemble one another in production” (239).¹

To paraphrase the above: when a speaker learns a new language, phonetically similar sounds are more difficult to learn in an native like fashion than phonetically dissimilar sounds. Speakers are born with the ability to perceive any given speech sound

¹ It should be noted that although all hypotheses of the SLM, including those that are not presented in this research, are concerned with the perception of L2 sounds, “the model does *not* claim [...] that all L2 production errors are perceptually motivated” (238).

and discern any phonetic detail (Bomba et al. 2001:479). In the infantile stage of language learning this initial limitless speech perception sets quickly on the perception of the L1 sounds and so “speech perception becomes automatic during L1 speech development, [... which in turn] may cause learners to attend less to phonetic detail when learning L2 than L1 sounds”.(Flege 1995: 241). To continue, when acquiring a new language it is hard to learn a speech sound that is phonetically very similar to a native L1 speech sound as the phonetic differences are hard to differentiate and therefor the new speech sound will not form a new phonetic category but will be mapped onto the already existing phonetic category of the L1. Thus, the L2 sound will be substituted for the nearest L1 sound, and consequently the L1 sound will be used in production when speaking the L2.

2.2. Comparison of English and Swedish Consonants

In order to answer answer the research questions posed above, a comparison needs to be made between the English and the Swedish phonemic inventory, with a focus on the consonantal phonemes.

		Place of articulation					
Manner of articulation		Labial	Dental	Alveolar	Palatal	Velar	Glottal
	Plosive	p b	t d			k g	
	Fricative	f	s		ç	ħ	h
	Nasal	m	n			ŋ	
	Approximant	v	l	ʝ	j		

Table 1. The Swedish consonantal phonemes. ²

² Table 1. is a reproduction of the table of Swedish consonant phonemes given in Bruce & Engstrand (2006: 17).

		Place of articulation							
Manner of articulation		Bilabial	Labio-dental	Dental	Alveolar	Post-Alveolar	Palatal	Velar	Glottal
	Plosive	p b			t d			k g	
	Fricative		f v	θ ð	s z	ʃ ʒ			h
	Affricate					tʃ dʒ			
	Nasal	m			n			ŋ	
	Lateral Approximant				l				
	Approximant	w				r	j		

Table 2. The English consonantal phonemes.³

Comparing the two phonetic profiles it is immediately apparent that Swedish does not have an affricate. Leinonen (2004) did describe the existence of an affricate [tʃ] in Finland-Swedish functioning as a allophone of the archaic Swedish dorsoalveolar fricative [ç] (Riad 2014: 58). It was however revealed in Leinonen's (2004) study that Finland-Swedish speakers often realise [tʃ] as the fricative [ç] and that Finland-Swedish speakers and Sweden-Swedish speaker have little knowledge of each other's sibilant systems (2). Furthermore only a small percentage of Finland's population speaks Swedish. For these reasons the possible influence on Swedish of the allophonic property of the Finland-Swedish affricate has been dismissed in this thesis.

2.3. The Perception of English in a Native Swedish Context

When a L2 sound does not exist in the L1, the learner of this L2 will "use the closest L1 phoneme as a "substitute" for the unfamiliar L2 phoneme" (Flege 1995: 263). This "L1-for-L2 substitution implies that an L2 phoneme has been perceptually linked to a particular L1 phoneme on some basis. It implies further that the learner has either failed to discern the phonetic difference between L1 and L2 phonemes or allophones, is unable to motorically render a correctly perceived difference, or both" (263). In other words, when a sound does not exist in a phonetic category of the speaker's native language, he or she will typically not be able to perceive the non-native speech sound for what it is. The non-native speech sound will be mapped onto the nearest phonetic category and as a result be produced as such (Dupoux et al. 1999:1568). To clarify the following example is given: the Dutch phonemic inventory includes the voiceless velar stop [k] but not the voiced velar

³ Table 2. is a reproduction of the table of English consonant phonemes given in Roach (2009: 52).

stop [g], which, in contrast, does exist in the English phonemic inventory.⁴ Therefore [g] in English words such as 'good' [gʊd] and 'grape' [greɪp] is typically perceived as the closest native sound [k] and therefore these words are usually pronounced as [ku:t] and [kreɪp].

Given the fact that the voiceless post-alveolar affricate does not exist in Swedish, and given the relation between (non-native) sound perception and production, it is possible that the English post-alveolar affricate [tʃ] is mapped onto the closest phonetic category in Swedish and perceived by native Swedish speakers as the alveolar-palatal fricative /ç/. And because [tʃ] is perceived as [ç], it will be produced as such. This assumption is supported by the findings of Leinonen (2004) and Jerving (2015).

Nonetheless, this research is based on the premise that the voiceless affricate is, albeit with complication, perceived and produced. In support of this evidence is given in Leinonen (2004), and Jerving (2015), that the English voiceless affricate, or a phonetically similar sound, is perceived and produced. Continuing, with the very present influence of English in Swedish society, it is likely that Swedish speakers who have been exposed to English for a long time, starting at a relatively early age, have formed a new phonetic category onto which the English affricate [tʃ] can be mapped. Depending on the age of onset of exposure, and the intensity and duration of exposure to English, the stability and reliability of this new phonological category can vary (Eefting and Flege 1988: 729-30). This can account for the variance in perception of the affricate [tʃ] across native Swedish speakers.

2.4. The Production of English in a Native Swedish Context:

When comparing the English and Swedish phonetic profile it can be seen that both English and Swedish have the stop /t/. However, in English /t/ is realised as alveolar plosive [t], whereas /t/ in Swedish is always realised as a dental plosive [t̪]. In English the sibilant fricative that corresponds with the onset sound in 'ship' is realised as (post)-alveolar fricative [ʃ]. Swedish has a similar sibilant fricative to the English /ʃ/, yet this sound is realised as palatal fricative [ç]. As is discussed above, it is very likely that the slight phonetic differences between [t] and [t̪], and [ʃ] and [ç] are not picked up on by Swedish learners of English. Thus when Swedish speakers learn English, /t/ will not be realised as an alveolar plosive, but as the Swedish dental plosive, and the English alveolar fricative /ʃ/ will be realised as the Swedish palatal /ç/.

⁴ For the Dutch consonantal phoneme inventory see Booij (1995: 7).

In contrast to Swedish, English does have the (post)alveolar affricate /tʃ/, which is an accepted consonantal unit as /t/ and /ʃ/ are homorganic in their place of articulation, namely alveolar. /tʃ/ is not an existing or accepted consonantal unit in Swedish as /t/ and /ʃ/ are not made with the same articulators, as /t/ is dental and /ʃ/ is palatal. Although it is stated above that the voiceless post-alveolar affricate is most likely to be perceived as the Swedish palatal fricative /ç/ by Swedish speakers it is possible that once these Swedish L2 English speakers “gain experience in the L2, they may gradually discern the phonetic difference between L2 sounds and the closest L1 sound(s)”, in this specific case, between [tʃ] and [ç] (Flege 1995: 263). And when this happens “a phonetic category representation may be established for the [tʃ] that is independent of representations established previously for [ç] ” (263). Following this it is most likely that the English /tʃ/ is perceived as and produced as [tʃ] by native Swedish speaker. This can account for the difficulty that native Swedish speakers have in producing the English affricate as it takes a lot more effort for the tongue to move from a dental position to a palatal position that it does for native English speakers to produce an affricate, as in the native English affricate is produced in (post) alveolar position only.

2.5. Level of Attention to Speech, and Articulatory Effort in Production

Different speaking situations predict different levels of attention to speech. For instance, when speaking in front of an audience or reading out aloud, the level of attention a speaker pays to their speech is higher than when a speaker is having a casual conversation with a friend (Van Herk 2012:105). These different levels of attention correlate with the amount of effort a speaker puts into their speech production. When participating in a casual conversation with a friend, a speaker will put little effort in their speech production, whereas a speaker will put a lot of effort in their speech production when reading out loud (Flemming 1997: 7).

Furthermore, even within one utterance the level of attention to speech and the amount of effort put into speech production can vary. “It is generally agreed that consonants in syllable onset tend to be produced with greater articulatory effort and precision and longer duration than those in coda” (Cheng & Zhang 2015: 12)

3. Research Questions and Hypotheses

3.1 RQ1: Is there and what is a phonetic explanation for the difficulty that native Swedish speakers have in the production of the English voiceless affricate?

Although there is, at the moment, no direct scientific evidence that can provide an explanation for the apparent difficulty that native Swedish speakers have in producing a voiceless affricate in English, the following phonetic explanation can be theorised based on the information presented in the chapter above. When native Swedish speakers learn English they will initially perceive the English voiceless affricate as their native voiceless palatal fricative. Over time, with sufficient input, the learner will be able to perceive the phonetic differences between the English voiceless affricate and their native Swedish palatal fricative in terms of manner of articulation, namely the initial plosive of the affricate will become apparent, and a new (non native) phonetic category in the learner's L2 English will be established for the English voiceless affricate, which is most likely represented as [tʃ]. The production of [tʃ] ask for a more intrinsic movement of the tongue than the production of the native English [tʃ].

To summarise, in answer to RQ1, it can be argued that the difficulty that native Swedish speakers have in producing a voiceless affricate in English lays in the fact that native Swedish speaker produce this affricate as a consonantal unit comprised of a dental stop and a palatal fricative which is a more arduous movement of the tongue than the native English affricate calls for.

3.2. RQ2: Is there and what is a phonetic explanation for the inconsistency in production of the voiceless affricate within the same native Swedish speaker, i.e. why a speaker produces the voiceless affricate successfully in the one situation, but not in the other?

This question arises from the fact that is has been observed by the researcher that there is a variation within native speakers of L2 English in the production of the voiceless affricate (e.g. p.1.). Following chapter 2.3, 2.4, and 2.5, it can be theorised that when a native Swedish speaker, who is aware of the affrication in English, puts more effort in his or her speech, it is more likely for affrication to occur. Given the fact that the level of attention to speech correlates with the amount of effort that is utilised in speech production it is likely that the more attention a native Swedish speaker pays to their speech in English, the more instances of affrication will occur. Thus, with the aim of answering RQ2, namely “why is the voiceless affricate produced inconsistently within the same native Swedish speaker in L2 English?”, the following hypotheses have been made:

Hypothesis I: Affrication is more often produced by native Swedish speakers in L2 English in controlled/attentive speech than in casual/free speech.

Hypothesis II: Affrication is more often produced in onset position than in coda position.

In the attempt to provide evidence for Hypothesis I and II the following experiments which are presented in chapter 4 were set up.

4. Methodology

4.1. Procedure and Materials

To test hypothesis I, i.e. to see whether there is a difference in the production of the affricate among different levels of attention in speech, three tasks were devised:

- a 'casual or free speech' task, in which the level of attention towards speech is the lowest;
- a story-reading task, in which the level of attention is medium;
- a wordlist-reading task, in which the level of attention is the highest.

In the 'free speech' task participants were asked to look at a set of pictures and pick out a few that triggered a memory or a story for them, after which they were asked to tell the researcher about said memories or stories. The set of pictures, 12 in total, were carefully chosen from a set of pictures developed by Rossion and Pourtois (2004) and all but two included pictures that in English represent words with the voiceless affricate (see Appendix A). The participants were asked to speak for about 3 minutes.

Although the 'free speech' task, from here on referred to as the picture-task, was still a controlled task as the participants were asked to talk about the pictures that were purposefully shown to them, it was thought that this task neared free/uncontrolled speech enough as participants were free to form their own sentences and choose their own words, and thus were more focussed on what they were talking about and very little focused on how they were speaking. A time limit was set on 3 minutes of uninterrupted free speech. The researcher did however utilise back-channeling signals such as "aha", and "uhmuhm" during the task. This was done with the idea in mind that the addition of back-channeling by the researcher would give the participants the idea that they were taking part in a more casual conversation or dialogue, rather than a monologue.

For the story-reading task participants were asked to read a funny short story that was written by the researcher (see Appendix B). They were asked to read the story twice. First to themselves so that they were able to familiarise themselves with the content and the language of the story, and secondly out loud to the researcher.

The short story (502 words in total) contained 31 voiceless affricates. Because the participants were allowed to read the short story for themselves first before reading it out loud and thus familiarise themselves with the content it was thought that the participants would be more focussed on telling the story rather than focussed on understanding the written text, and therefore had a medium level of attention towards their speech.

For the wordlist-reading task the participants were presented with 15 lists of words, every list containing 8 words, and were asked to read these out loud. The lists combined contained 20 words with a voiceless affricate (see Appendix C). As reading out lists of words is an 'unnatural' speaking situation it was thought that the participants had a high level of attention towards their speech. As such high level of attention to what one is saying and how one is saying it could possibly draw the participants focus to what is being tested the lists of words were composed in such a way that the chance of this happening was minimised. Each list of words consisted of 7 words belonging to the same semantic category and 1 word belonging to a different semantic category. This way the participants were more likely to notice the words that did not belong in the semantic category rather than notice the targeted speech sound. ⁵

To test hypothesis II, i.e. to see whether there is a difference in the production of the voiceless affricate in onset and in coda position the lists in the wordlist-reading task consisted of 10 words with the voiceless affricate in onset position and 10 words with the voiceless affricate in coda position. To see whether there was a difference in the quality of sound production in onset and coda position in general, the lists also included 10 words with the voiceless post-alveolar fricative in onset position, 10 words with the voiceless post-alveolar fricative in coda position, 10 words with the voiceless alveolar fricative in onset position, 10 words with the voiceless alveolar fricative in coda position, 10 words with the voiceless alveolar stop in onset position, and 10 words with the voiceless alveolar stop in coda position. It should be noted that 70 % of the words with a voiceless affricate in coda position are spelled with the sequence 'tch' in coda position, e.g.: *match*, *witch*, *patch*, etc.

After the tasks were completed and the participants were debriefed in full detail on the subject of this research, and after establishing whether the participant had been aware of what was actually being tested, each participant was asked what their thoughts were on

⁵ The wordlists were not taken from or tested based on published academic corpora. The wordlists were composed by the researcher and the semantic category association was based only on the researcher's own judgement. This was deemed to be sufficient as this research was not intended to test semantic category association.

the matter, i.e.: if they were aware that the inability to produce the [tʃ]-[ʃ] distinction attributed to the Swedish 'foreign' accent in English, whether they could always hear this distinction, and whether they could hear it when they themselves 'mispronounced' [tʃ] for [ʃ]. All tasks for this research were explained and performed in English. All tasks were recorded in the Praat programme on a laptop.⁶ Most tasks were performed over Skype and the Facebook call option.

Once all the data was collected the recordings were analysed. The two reading tasks were analysed as follows: For each instance that the texts of the reading tasks required a voiceless affricate and a voiceless fricative was produced, this production of a voiceless fricative was counted as a 'mispronunciation'. In the case of the picture task it was first established which words produced in the recordings require a voiceless affricate in English, and secondly which of these words were actually produced with a voiceless fricative, which then counted as a 'mispronunciation'.

Initially the recordings were simply 'listened to' by the researcher and judgement of a sound being 'mispronounced' was made solely on the basis of the researcher's perception.⁷ If the researcher did however question the possible production of an affricate, that instance was analysed in the spectrogram of Praat to see whether a plosive was produced with a following fricative, opposed to just a fricative.

4.2. Participants

For this study 12 participants were recruited. All participants were raised as monolingual Swedish speakers and speak English as their L2. Special attention was paid to make sure that the participants did not speak any other language(s) containing an affricate (e.g. Persian, Modern Hebrew, etc.), as this could affect their overall perception and production of the affricate in English. To make sure that English was part of their everyday language, only native Swedish speakers who live in an English language environment were recruited. As this research has been carried out by the University of Amsterdam, mainly native Swedish speakers living in the international expat community in the Netherlands were targeted. All participants were between the age of 25 and 45, as statistically this age group is the biggest group of expats living in the Netherlands

⁶ Praat is a computer software programme which has been developed by Boersma and Weenink of the University of Amsterdam. The programme allows speech to be scientifically analysed in the field of phonetics and phonology. For more information see <http://www.fon.hum.uva.nl/praat/>

⁷ The researcher is a native speaker of English, with no auditory perception or processing disorder, so it was thought that this method of analysis was in sufficient order.

(Ooijsenaar and Verkooijen 2015: 13). All participants were recruited via an add on Facebook in a group for Swedish people in the Netherlands and Amsterdam (see Appendix D).

5. Results and Analysis

In this section the results from the three experiments are presented and analysed. In the following section the results of the experiments are presented and analysed. In section 5.1 the results per task per participant are presented. In section 5.2 the results per task are presented regarding the voiceless affricate in onset and coda position. In section 5.3 the results for the tasks are presented in a division of the male and female participants.

5.1. General Results and Analysis:

The percentages in table 3. below were calculated as follows:

For the picture-task the percentage of 'mispronunciation' of the voiceless affricate was first calculated per individual, dividing the number of mispronunciations by the number of instances that a word was produced that call for a voiceless affricate in English. The number of instances that a word with a voiceless affricate occurred per individual in the picture task was very varied as in the picture-task the participant were free to come up with their own 'text' or speech. For the total average percentage of 'mispronunciations' in the picture task, the total number of 'mispronunciations' in the picture-task was divided by the total number of instances that English calls for a voiceless affricate in the picture-task.

For the story reading task the number of mispronunciations were divided with the number of instances that English calls for an affricate per individual. To calculate the average percentage of mispronunciations in the story reading task the total number of mispronunciations were divided by the total number of instances that English calls for an affricate in the text (Table 4.).

In case of the wordlist-task the total number of 'mispronunciations' was divided by the number of preferred affricates in English in the wordlist per individual to calculate the individual percentage of mispronunciation. To calculate the average percentage of mispronunciations, the total number of mispronunciations in the wordlist-task was divided by the total number of instances that call for a voiceless affricate in the wordlist (Table 5).

	Number of words with an affricate	Number of mispronounced affricates	Percentage of mispronounced affricates
Part. O	8	6	75%
Part. B	—	—	—
Part. J	9	6	67%
Part. G	12	3	25%
Part. S	9	2	22%
Part. M	7	0	0%
Part. C	6	0	0%
Part. A	4	0	0%
Part. R	9	6	67%
Part. T	10	9	90%
Part. K	8	3	37,5%
Part. F	5	1	20%
Total.	87	36	41,3%

Table 3. Picture Task: Individual and total numbers and percentages of mispronunciation.

	Number of words with an affricate	Number of mispronounced affricates	Percentage of mispronounced affricates
Part. O	31	19	61%
Part. B	31	25	81%
Part. J	31	18	58%
Part. G	31	3	10%
Part. S	31	3	10%
Part. M	31	1	3%
Part. C	31	0	0%
Part. A	31	5	16%
Part. R	31	17	55%
Part. T	31	20	64,5%
Part. K	31	4	13%
Part. F	31	4	13%
Total	372	119	32%

Table. 4. Story Task: Individual and total numbers and percentages of mispronunciation

	Number of words with an affricate	Number of mispronounced affricates	Percentage of mispronounced affricates
Part. O	20	0	0%
Part. B	20	11	55%
Part. J	20	8	40%
Part. G	20	0	0%
Part. S	20	0	0%
Part. M	20	0	0%
Part. C	20	0	0%
Part. A	20	0	0%
Part. R	20	9	45%
Part. T	20	10	50%
Part. K	20	0	0%
Part. F	20	2	10%
Total	240	40	16,7%

Table. 5.: Wordlist-Task: Individual and total numbers and percentages of mispronunciation

On average the participants mispronounced 41,3 % of affricates in the picture-task, 32% of affricates in the story-task, and 16,7% of affricates in the wordlist-task (Table 6.).

	Total number of tokens with affricate	Total number of tokens mispronounced affricate	Total percentage of mispronounced affricates
Picture Task	87	36	41,3%
Story Task	372	119	32%
Wordlist Task	240	40	16,7%

Table. 6: Average number and percentage of mispronunciations per task.

5.2 Results and Analysis of the Voiceless Affricate in Onset and Coda Position

The wordlist-task also served as a way to see whether there was a difference in production of the voiceless affricate between an onset and coda position. Out of the total mispronunciations in the wordlist-task only 5 % occurred in coda position, which is 1,7% of the number of affricates in coda position in the wordlist-task.

	Total number of affricates in onset position.	Total number of affricates in coda position.	Total number of mispronounced affricates in onset position.	Total number of mispronounced affricates in coda position.	Total percentage of mispronounced affricates in onset position.	Total percentage of mispronounced affricated in coda position.
Picture Task	75	12	36	0	48%	0%
Story Task	324	48	111	8	34,3%	16,6%
Wordlist Task	120	120	38	2	31,7%	1,7%
Total of all Tasks	519	180	185	10	35,6%	5,5%

Table 7.: Numbers and percentages of affricates in onset and coda positions and mispronunciations

With the thee task combined 35,6 % of the affricates in onset position were mispronounced, and 5,5 % of affricates in coda position were mispronounced (Table 7.).

5.3. Male versus Female Participants:

Setting up the experiments for this research, the gender of the participants was never considered to be an meaningful variable. And although it was never intended, it so happened that 6 out of the 12 participants in this research were female. Once the results of the experiments were analysed it became clear that there was a difference between the average results of the male participants and the average results of the female participants. On average the female participants produced far less ‘mispronunciations’ of the voiceless affricate than the male participants (table 8.).

	Picture-Task average % mispronounced affricates	Story-Task average % mispronounced affricates	Wordlist-Task average % mispronounced affricates
Male	62,5%	54,8%	31,6%
Female	15,3%	9,1%	1,7%

Table. 8. Average number of mispronunciations per task: male versus female

6. Discussion

In the sections below the results in general are discussed in regards of HI and II, followed by a discussion of the individual results of a few participants.

6.1.: General Discussion in Light of H1 and H11:

Hypothesis I of this research states that “affrication is more often produced by native Swedish speakers in L2 English in controlled/attentive speech than in relaxed/free speech”. The results of the experiments support this hypothesis.

The results show that the participants on average ‘mispronounce’ the voiceless affricate the most in the picture-task the most for which the level of attention to speech was the lowest, followed by the story-task which required a medium level of attention to speech, and mispronounced the voiceless affricate the least in the wordlist-task, which required the highest level of attention to speech.

When it comes to hypothesis II the data seems to contradict the presumption that affrication is more often produced in onset position than in coda position.

Out of the total the 195 instances of mispronunciation of the voiceless affricate throughout the 3 production tasks, only 10 of these occurred in coda position. Furthermore, in the wordlist-task, which was also devised to test the difference between the production of the voiceless affricate in onset and coda position, only 2 out of the 40 mispronunciations occurred in coda position. What could then be an explanation for the refutation of H11?

Although it is not often discussed in the research on the acquisition of a second language, the orthography of both the L1 and L2 can have an influence on the perception and representation of new, non-native phonemes of the L2 (Nimz & Khattab 2015: 1). It is possible that the orthography of both Swedish and English influence the native Swedish learner of L2 English. It should then be noted that in Swedish words that are spelled with ‘ch’ are often pronounced with a fricative, and never, like in English, with an affricate (Riad 2014: 63). In the wordlist 7 out of the 10 words with an affricate in coda position reflect this voiceless affricate in their spelling, i.e.: ‘*witch*. The orthography of these words can aid even an inexperienced speaker of English, who relies solely on the orthography and pronunciation of their native Swedish, to produce a sound that is close to the English affricate, namely t + ch, or [t] + [ç].

The interpretation of orthography through a Swedish lens does however not paint the full picture when it comes to the production of affrication in coda position. For instance, none of the words in the story task are spelled with ‘tch’ in coda position, yet only a total average of 16,6% of mispronunciation occurred in coda position, opposed to a total average of 34,3 % of mispronunciation in onset position. So why, if not evidently because of the interpretation of orthography, is the affricate produced more often in coda position than in onset position? The answer could be that, although the consonant cluster

'tch' ([tʃ]) occurs almost never in Swedish, in the very few instance that this consonant cluster does occur, it occurs in coda position (Riad 2014: 58). Therefor it can be argued that the acceptability for an affricate in coda position is higher than in onset position, and as a result native Swedish learners of English may pick up on the English affricate in coda position earlier than they do on the affricate in onset position.

6.2: Male versus Female Participants:

Firstly, when the results of the three production tasks are categorised separately according to gender, these results too support Hypothesis I. As predicted by HI, the average percentages of both male and female participants show that there is a clear decline in mispronunciation of the voiceless affricate when the level of attention to speech is heightened.

What is striking about the results, when they are categories separately according to gender, is that the female participants made far less mistakes in the pronunciation of the voiceless affricate than their male counterparts. As stated before, it was made sure that all participants had the same level of language education, linguistic background and experience, exposure to English in everyday life, and active usage of English. Therefor it is highly interesting that all female participants performed better in terms of the production of the voiceless affricate in all three production tasks. So what could be the cause of this overt discrepancy in results between the female and the male participants?

A possible explanation could be that women in general have more 'linguistic awareness', as it is through language that women, more so than men, establish their position in society (Van Herk 2012: 93-93). Because of this heightened linguistic awareness it possible that a female native Swedish learner of English will either be superior in discerning the phonetic properties of the voiceless affricate and quicker in establishing a phonetic category for this phoneme than her male counterpart, be more cautious of her pronunciation of English (as well as her native Swedish) in any given speaking situation, or a combination of both.

6.3.: Participant B: Is a Phonetic Category in Place?

Firstly, participant B did not manage to perform in the picture task, so for this element of the research participant B is disregarded. In the story-reading task P.B. 'mispronounced' 81% of the affricates given in the text. In the wordlist-reading task P.B. 'mispronounced' 55 % of the affricates given in the text. For the words in the wordlist-

reading task only one of the instances of the affricate in coda position was mispronounced. When P.B. had completed the tasks, the researcher explained the nature of the research, emphasising very clearly on the ch-sh distinction. When the researcher noticed that P.B. did not react she asked whether the participant could hear the difference to which P.B. replied that he could not.

In light of H1, the individual results of participant B indicate that when participant B's level of attention to speech is heightened, the chance of a mispronunciation of the voiceless affricate declines. The term 'chance' is used here as the P.B.'s responses to the follow-up debriefing and interview indicated that P.B. had little perceptual awareness of the ch-sh distinction in English, i.e. he indicated that he could not hear the difference when the researcher gave very clear examples of the voiceless affricate opposed to the voiceless alveolar fricative.

When P.B.'s individual data is analysed further detail (data is not given in the text), it becomes apparent that, with the exception of one instance, all affricates that are produced correctly in the two reading tasks combined occurred either in coda position, or, in two instances, in intervocalic position. Based hereon the conjecture can be made that P.B. has established a phonetic category for the English affricate, yet the phoneme that is filed in this category is position-sensitive, i.e. only those instances of the affricate that appear in a non-onset position are mapped onto the category. This could therefore also account for the difference in 'mispronunciations' between the two reading tasks, as only 13% of the words in the story-task contained an affricate in coda position, whereas 50% of the affricates in the wordlist-task occurred in coda position.

6.4.: Participant J:

In the picture task participant J 'mispronounced' 66 % of affricates, in the story-reading task 58 % of affricates, and in the wordlist-reading task 40% of the affricates. In the wordlist-task none of the affricates in coda position were mispronounced. When asked, after the production tasks, whether the participant was aware of the ch-sh distinction, P.J. answered that he was aware of the distinction, and that he is frequently commented upon when he 'mispronounces' the voiceless affricate in English by his environment. He added that he cannot always hear that his intended production of the voiceless affricate differs from an actual perceived voiceless affricate, or as he commented: "I sometimes do not hear the difference between what I think I say (intending and implying a voiceless affricate), and what my interlocutor hear. I mean, I know that I should and want to

pronounce the 'tsh' sound, and then I think and hear for myself that I do, but then the people around me say that I don't".

The individual results of participant J confirm the predictions made in H1: the production of an affricate increases as the level of attention to speech increases. Uniformly with his results, P.J. indicated that he is very much aware of the ch-sh distinction in English. In addition, P.J. indicated that his intention to produce the affricate are not always realised in articulation (although he himself mostly does not hear it when the affricate is unsuccessfully realised).

In the case P.J. is can be assumed that a phonetic category for the English affricate is in place, but that the cues for the articulatory process to produce the affricate are not yet fully engrained. That the motoric skills for the affricate are not automated are likely due to the fact that it is indeed an unfamiliar and intrinsic movement for the tongue. Thus, in this case, the assumption that the production of the Swedish version of the English affricate takes quite some effort is supported.

6.5. Participant O:

The results of participant O are in clear agreement with the predictions made in H1. More interestingly so is the difference of production errors made in the picture-task and the story-task compared to the non-existent production error made in the wordlist-task. P.O.'s results confirm H1, especially when it is taken into consideration that P.O. reckoned the wordlist-task to be a speed-reading task, and consequently raised his level of attention to his speech even higher than was intended. This resulted in a 0% mispronunciation rate for the wordlist-task, opposed to a 75% mispronunciation rate in the picture-task, and a 61% mispronunciation rate in the story-task.

6.6.: Participant G: High Level of Linguistic Awareness.

Participant G 'mispronounced' 25% of affricates in the picture-task, 10% of affricates in the story-reading task, and 0% in the wordlist-reading task. Once all tasks were completed the researcher asked whether the participant was aware of what had been tested in the tasks. P.G. answered that during the production tasks he had been aware of the fact that pronunciation was probably tested, and that at the time that this question was posed, he figured that it should probably be the ch-sh distinction. When the researcher explained the premises on which the research is established, i.e. explaining the different stages of perception of the non-native affricate, that a Swedish learner of English will over time probably learn to discern the differences between the English affricate and the

Swedish fricative in terms of gradually learning to perceive the initial plosive in the English affricate, P.G. confirmed that this was exactly what had happened to him. When asked to elaborate on this P.G. said that in the early stages of learning English (age 10 (school education) till 20) he had never been really aware of a difference between the English affricate and the Swedish fricative. P.G. added that he may have heard a variation between the two sounds, but never categorised them as being significantly different ("I think I just heard it as a slight variation of the 'sh' sound). After the age of 20, once he started working in an international speech community where English was the lingua franca, did he start to pick up on the distinction between the affricate and fricative, and how they are meaningful in the production of English.

Participant G.'s results confirm HI. More interesting was his confirmation of the fact that the establishment of a phonetic category for- or the awareness of- the English affricate had gradually happened, over time and with the attainment of more and more linguistic experience. Perhaps the fact that P.G. has a high level of linguistic awareness confirms HI even more. Even though P.G. proved more linguistically aware than the other participants, he still 'mispronounced' the affricate more in the the picture-task, followed by the story-task. Thus the production of the affricate by native Swedish speakers of L2 English is indeed governed by an effort constraint.

7. Conclusion

Based on what is presented above it is safe to say that when learning and mastering a new language, your native language will influence the perception, production, and interpretation of orthography of that new language. In terms of perception of the voiceless affricate by native Swedish speakers, two perceptive processes are at work; The phonetic difference in manner of articulation will be discerned between the English voiceless post-alveolar affricate and the Swedish voiceless palatal fricative. The phonetic difference in place of articulation will however not be discerned between the English post-alveolar affricate and the Swedish consonantal unit of the voiceless dental plosive and the voiceless palatal fricative that resembles the English voiceless affricate. Consequently this causes some difficulty in the production of affrication as for the Swedish interpretation of the affricate the tongue needs to move from a dental position to a palatal position, which takes a lot of effort. As the production of the affricate takes effort, it is likely that the production of the affricate occurs more in attentive speech than in casual speech (HI). And as the level of effort in production varies even in a single utterance, decreasing in coda position, it is plausible that the production of the affricate happens less in coda position

than in onset position (H2). These were the premises and hypotheses on which this research was based.

The results of the experiments positively confirm Hypothesis I. Overall there seems to be a correlation between the level of attentiveness to speech and the instances of production of the affricate, where the voiceless affricate were pronounced more successively when the level of attention to speech was higher. However, the influence of orthography should not be disregarded. Hypothesis II was fully disproved. Again the influence of orthography should not be ignored. Yet the influence of orthography could not fully account for the very few instances of mispronunciation of the affricate in coda position. The level of acceptability of the consonant cluster [tʃ] in either an onset position or a non-onset position, of which the latter has a higher level of acceptability, should also be taken into account.

In conclusion, the combination of the influence of the Swedish language in the perception of the English voiceless affricate, the consequential difficulty in production of the voiceless affricate, and the slighted influence of orthography make for an almost insurmountable impediment to produce the voiceless affricate for a native Swedish speaker of L2 English.

8. Limitations and Further Research

The picture task in this research proved to be the biggest limitation. Set up to be a task in which casual speech could be elicited, giving the participant free rein to say whatever they wanted with only a few pictures to guide their speech, it became clear that this method provided random results and it is questions whether any reliable conclusions can be drawn from this data.

Because HIII was refuted a more in-depth research of the voiceless affricate in onset versus coda position is proposed, especially to see what the relation of orthography is to the pronunciation of the voiceless affricate.

This research only tested the English voiceless affricate, and it should be interesting to see how the results from this research compare to research done of the voiced affricate in the L2 English of native Swedish speakers.

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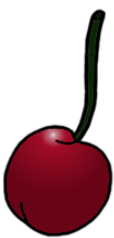
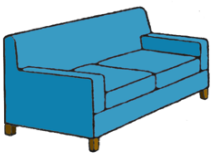
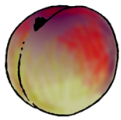
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Appendices

Appendix A

Pictures from the picture task.



Appendix B

This is the short story that the participant were presented with.

Please read the following story about Mary out loud.

This is the story of the unfortunate Mary Åkerlund. Mary grew up in Trosa, a small town on the east coast of Sweden. Mary's mother, a charming woman from Liverpool, ran a small fish and chips shop down by one of Trosa's most beautiful beaches, while Mary's father spent most of his time buying, repairing, and selling vintage Chesterfield furniture. When Mary was seven, her parents took her on an excursion to one of Sweden's oldest chalk mines, which had just opened to the public after a prehistoric mural was discovered down one of its tunnels. Sadly, the porous walls of the tunnel collapsed during the family's excursion and Mary was the only one to make it out alive. After the tragic accident the poor orphaned child was taken in by Jörgen, a close family friend and Trosa's chief of police, who raised Mary like his own. As Jörgen already had five children to support, and the addition of sixth mouth to feed was no cheap matter, Jörgen decided to organise an annual charity event at Trosa's town hall, in order to raise money for Mary's upbringing. By the time Mary was ten she was an active participant in Jörgen's charity event, selling homemade Äppelkaka served with vaniljsås, for which she charged the humble price of 3 kronor. By the time Mary was fifteen her cheap but rich apple pie was famous not only in Trosa, but throughout the whole county of Södermanland, and every year her dish attracted more and more people to the charity event. Nonetheless, for the event's 10th anniversary, Mary decided to surprise the guests with something completely different by serving a savoury venison pie with a sauce made from sour cherries which she had picked and pipped herself. Over the years it had become a tongue-in-cheek ritual that Mary opened the event's buffet by feeding Jörgen a piece of pie, and as per tradition, this year too she stood in front of the banquet's long table with a fork at the ready, anxious to see Jörgen's reaction to her surprise dish. While the crowd applauded loudly, Jörgen closed his eyes and let Mary feed him the deliciously anticipated morsel, only to open his eyes again in shock moments later, once he realised that it was not apple pie he was tasting. The shock seen on Jörgen's face stifled the cheering crowd and the town hall grew silent. Jörgen frowned but decided to give it a chance and chewed the unfamiliar food diligently. It was then that, completely out of the blue, the bells of the church next to the town hall started chiming with a deafening force. Startled by the sudden noise, Jörgen gasped and

choked on a stray cherrypip hidden in the pie's sauce. The man died on the spot. Stricken with grief, and realising the grave mistake she had made by choosing to bake something different for that year's charity event, Mary moved to China and was never seen or heard of again.

Appendix C

- A.
1. sugar melon
 2. fruit
 3. cherry
 4. peach
 5. strawberry
 6. pineapple
 7. tangerine
 8. plum

- B.
1. chipmunk
 2. fish
 3. squirrel
 4. mouse
 5. rabbit
 6. rat
 7. beaver
 8. guinea pig

- C.
1. cheeta
 2. snake
 3. lynx
 4. shark
 5. tiger
 6. ocelot
 7. crocodile
 8. wolf

- D.
1. desk
 2. chaise longue
 3. bench
 4. chair
 5. stool
 6. couch
 7. ottoman
 8. seat

- E.
1. German
 2. Dutch
 3. Greek
 4. Chinese
 5. French
 6. English
 7. Hungarian
 8. Polish

- F.
1. banshee
 2. fairy
 3. harpy
 4. sharpie
 5. witch
 6. sorceress
 7. succubus
 8. mermaid

- G.
1. shuffle
 2. march
 3. dash
 4. run
 5. freeze
 6. bolt
 7. tiptoe
 8. leap

- H.
1. cow
 2. pig
 3. donkey
 4. sheep
 5. chicken
 6. pitchfork
 7. horse
 8. goat

- I.
1. forehead
 2. cheek
 3. nose
 4. mouth
 5. neck
 6. chin
 7. eyebrow
 8. eye

- J.
1. cucumber
 2. olive
 3. oil
 4. radish
 5. chicory
 6. lettuce
 7. tomato
 8. onion

- K.
1. bite
 2. munch
 3. nosh
 4. chew
 5. purge
 6. gobble
 7. devour
 8. nibble

- L.
1. sherry
 2. champagne
 3. vodka
 4. scotch
 5. cognac
 6. raki
 7. slivovitz
 8. aquavit

M.

1. mesh
2. crochet
3. sew
4. patch
5. bind
6. knit
7. weave
8. embroider

N.

1. players
2. football
3. match
4. penalty
5. goal
6. cola
7. field
8. referee

O.

1. bus
2. truck
3. house
4. car
5. bike
6. moped
7. plane
8. ferry

Appendix D

This is the advertisement posted on Facebook via which participants were recruited. The advertisement is in Swedish. The advertisement was translated from the English origin text to Swedish by Trissa Ellingjord, a native Swedish friend and professional translator and interpreter. For the English origin text see below.

Hej alla svenskar i Amsterdam,

*Jag behöver er hjälp. Jag skriver för närvarande på min master i språkvetenskap vid universitetet i Amsterdam, där jag undersöker hur personer med svenska som modersmål pratar engelska. Därför behöver jag din hjälp. Det skulle vara av stor betydelse för min forskning om du vill delta i min undersökning. **

Deltagandet består av en 30 minuters intervju med tre engelsktalande uppgifter. Intervjun spelas in på min dator. Det inspelade materialet kommer endast att användas för min undersökning. Intervjun kan hållas via FaceTime, Skype eller (allra helst) personligen. En intervju via FaceTime eller Skype kan planeras när som helst när det passar dig. En personlig intervju kan bara hållas på dagtid, på min arbetsplats som är en liten pub på Leidseplein.

Även om jag inte kan betala dig för ditt deltagande, eftersom detta inte är tillåtet enligt universitetets etiska kommitté, kommer du att belönas med en liten present och min eviga tacksamhet.

Vänligen meddela mig om du är intresserad.

Tack på förhand!

**För att inte påverka undersökningens resultat kan jag inte närmare beskriva vad syftet med undersökningen är förrän efter intervjun, men efter intervjun berättar jag gärna mer om mitt spännande forskningsarbete.*

English origin text for the Facebook advertisement:

Dear Swedish people of Amsterdam,

*I hereby humbly ask for your help. I am currently writing my Linguistics Master thesis at the University of Amsterdam, for which I am researching the use of English by native Swedish speakers. Thus I come to you. It would be of the greatest help if you can participate in my research. **

Participation entails a 30 minute interview involving three English speaking tasks. The interview will be recorded. The recorded material will solely be used for the purpose of my research.

The interview can be held over FaceTime, Skype, or (preferably) in person. An interview over FaceTime or Skype can be planned at any given moment. An interview in person can only be held during the day, at my workplace, a small pub near the Leidseplein.

Although I cannot pay you for your participation, as this is determined as such by the Ethics Committee of the University of Amsterdam, you will be rewarded with a small gift and my endless gratitude.

Please let me know if you are interested.

Thanks in advance!

** For the sake of research the exact subject of my research cannot be revealed before and during your participation. Yet you will be debriefed in full detail immediately after the interview is completed.*