

SECOND LANGUAGE ACQUISITION: THEORETICAL IMPLICATIONS
FOR OPTIMALITY THEORY

A Dissertation Presented

by

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"When I was at Oxford [Cambridge]" ... sounds suspect even to me ... Even at the time, I was never quite convinced of the reality of my presence there. Day after day, walking those narrow lanes and lush courtyards, looking up to see a slip of cloud drifting behind a spire, I had to stop in disbelief. I couldn't get used to it, but that was all right. After every catch of irreality, I felt an acute consciousness of good luck; it forced me to recognize where I was and give thanks'.

*In Pharaoh's Army
- Tobias Wolff*

Here are some people that I would like to give thanks to:

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I would like to thank my family, Mum, Dad, and Michael, for supporting me always.

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I would like to thank Paul de Lacy for his role as my supervisor. His interest in my topic, his availability, his generosity of time, and his valuable comments not only allowed me to focus but also kept me motivated throughout the arduous process that was writing this thesis you're about to read.

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- *A final note from me to future students*

It's now the start of June 2004. Six months ago, I started to work on this thesis. This was perhaps one of the hardest six months of my academic life. There were times when I wanted to give up, and almost did. There were times when I almost through my computer across the room, and almost did, if it weren't for the fact that I couldn't lift the beast. What I'm trying to say is that I never thought that I could complete this course, but I have, and so will you. Here's some advice: small steps.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS.....	ii
LIST OF TABLES.....	v
LIST OF FIGURES.....	vi
CHAPTER	
1. INTRODUCTION.....	1
1.1 Introduction.....	1
1.2 The proposal of this thesis.....	1
1.3 Evidence corresponding to the transfer hypothesis.....	2
1.4 Evidence required to motivate access to the innate H_0	3
1.5 Outline	3
1.5.1 Summary: leading ideas.....	4
2. THEORY.....	5
2.1 Introduction.....	5
2.2 The mechanics of an OT grammar.....	5
2.3 OT and first language learnability.....	6
2.3.1 The initial and final states: language development.....	6
2.4 Conclusion.....	7
2.4.1 The status of L1 and L2 acquisition within OT.....	7
3. CONTRASTING VIETNAMESE AND ENGLISH PHONOLOGY.....	8
3.1 Introduction.....	8
3.2 The syllabic structure of Vietnamese.....	8
3.2.1 Coda complexity in Vietnamese and English.....	9
3.2.1.1 Coda complexity: the nature of diphthongs.....	12
3.2.2 Coda surfacing in Vietnamese and English.....	14
3.2.3 Delimiting coda consonants in Vietnamese.....	15
3.2.3.1 Coda devoicing: Vietnamese and English.....	15
3.2.3.1.1 Conclusion.....	16
3.2.3.2 Continuants in Vietnamese and English.....	17
3.2.3.2.1 Conclusion.....	18
3.3 Conclusion.....	19
4. VIETNAMESE RANKING _{L1} : THE INPUT TO RANKING _{L2}	21
4.1 Introduction.....	21
4.2 Theoretical procedure and methodology.....	21
4.2.1 Materials and procedure.....	21
4.3 The emergence of the unmarked in the interlanguage.....	22
4.3.1 Predicting TETU: WBP in the interlanguage.....	23
4.3.2 Predicting TETU: VOP in the interlanguage.....	23
4.3.3 Predicting TETU: *CONT in the interlanguage.....	23
4.3.4 Conclusion.....	24
4.4 Results: evidence for language transfer.....	24
4.4.1 Results: WBP and coda simplification in the interlanguage.....	24
4.4.1.1 TETU and morpheme differentiation.....	26
4.4.1.2 Summary.....	28
4.4.2 Results: VOP and devoicing in the interlanguage.....	29
4.4.2.1 Additional functions of [[VOP » IDENT(voice)]].....	30

4.4.2.2 Summary.....	31
4.4.3 Results: [[*CONT » MAX]] in the interlanguage.....	31
4.4.3.1 Summary.....	32
4.4.4 The hybrid interlanguage.....	32
4.4.4.1 Multiple Vietnamese rankings in the interlanguage.....	32
4.4.4.2 Vietnamese and English rankings in the interlanguage	33
4.4.4.3 Summary.....	34
4.5 Conclusion.....	34
5. VARIATION IN THE INTERLANGUAGE.....	36
5.1 Introduction.....	36
5.2 Variation: implications for OT as a theory of SLA.....	36
5.3 Interpretation and evidence for SLA.....	37
5.4 Conclusion.....	38
6. NO DIRECT ACCESS TO H_0	40
6.1 Introduction.....	40
6.2 Theoretical motivation	40
6.3 Experiment methodology and design.....	41
6.3.1 Conclusion.....	42
6.4 Experimental results.....	42
6.4.1 Conclusion	43
6.4.2 Language transfer and the innate: a differentiation.....	43
6.5 Noting an intriguing case: is this access to H_0 ?.....	44
6.6 Conclusion.....	45
7. WHAT IS THE INPUT TO L2?.....	46
7.1 Introduction.....	46
7.2 SLA and underlying representations.....	46
7.3 Insights from loanword phonology.....	47
7.3.1 Jacobs and Gussenhoven (2000).....	47
7.3.2 Perception, production, and reranking.....	49
7.3.3 Misperception and no motivation for reranking.....	52
7.3.3.1 Falsifying this approach.....	52
7.4 Conclusion.....	53
8. SUMMARY AND IMPLICATIONS.....	54
8.1 Introduction.....	54
8.2 Two concurrent grammars - <i>Leading Idea 1</i>	54
8.2.1 Theoretical consequences of concurrent grammars.....	55
8.3 Language transfer and TETU – <i>Leading Idea 2, 3, and 4</i>	56
8.4 No access to H_0 - <i>Leading Idea 5</i>	57
8.5 Homogenous L1 and L2 acquisition – <i>Leading Idea 6</i>	58
8.6 Closing comments.....	58
APPENDIX: VIETNAMESE RANKING TRANSFER IN THE INTERLANGUAGE.....	59
BIBLIOGRAPHY.....	64

LIST OF TABLES

Table	Page
1.1	Consonant deletion in the interlanguage..... 2
1.2	Final obstruent devoicing in the interlanguage..... 3
3.1	Constraint ranking: moving from Vietnamese to English..... 20
4.1	Syllabic structure and deletion in the interlanguage..... 25
4.2	Consonant deletion in the interlanguage..... 25
4.3	Bimorphemic inputs and their mappings..... 26
4.4	Bimorphemic inputs and deletion in the interlanguage..... 27
4.5	The extent of Vietnamese transfer in the interlanguage..... 29
4.6	Devoicing in the interlanguage..... 29
4.7	Final obstruent devoicing in the interlanguage..... 29
4.8	The extent of Grammar _{L1} transfer in the interlanguage..... 31
4.9	Continuant deletion in the interlanguage..... 31
4.10	Deletion as a consequence of *CONT in the interlanguage..... 32
4.11	The extent of Grammar _{L1} transfer in the interlanguage..... 32
4.12	Coexisting Vietnamese processes in the interlanguage..... 33
4.13	The extent of Grammar _{L1} transfer in the interlanguage..... 33
4.14	Coexisting Vietnamese and English processes in the interlanguage..... 33
4.15	The extent of Grammar _{L1} transfer in the interlanguage..... 34
4.16	Necessary rerankings in the acquisition of English..... 35
5.1	Predicting interlanguage outputs..... 39
6.1	An example of nouns and verbs elicited..... 42
6.2	Task I results: monosyllabic tokens of the structure (C)CVVN and VN..... 42
6.3	Tokens with either long vowels or diphthongs..... 43
6.4	Task I results: monosyllabic tokens of the form (C)CVVN..... 43
6.5	Bimorphemic inputs and their mappings..... 43
8.1	Constraint ranking: moving from Vietnamese to English..... 56

LIST OF FIGURES

Figure	Page
1.1	L2 acquisition as copy and reranking of the Vietnamese input..... 2
2.1	Basic OT architecture..... 5
2.2	Schematising first language acquisition in OT..... 6
3.1	Moraic structure: Vietnamese and English syllabification..... 10
3.2	The moraic structure of /aɪ/ - (quai - ‘handle’)..... 12
3.3	The moraic structure of /kaɪnd/ - (‘kind’)..... 13
3.4	The constraint rankings of English and Vietnamese..... 13
3.5	The constraint rankings of English and Vietnamese..... 14
3.6	The constraint rankings of English and Vietnamese..... 17
3.7	The constraint rankings of English and Vietnamese..... 19
3.8	Vietnamese annotated ranking..... 19
3.9	English annotated ranking..... 19
4.1	Summarising the results: TETU and faithfulness in the interlanguage..... 24
5.1	Consonant deletion: individual variation..... 36
5.2	Invariant ranking and SLA..... 37
5.3	The interlanguage in OT: ranking variation..... 38
6.1	L2 acquisition as a result of direct access to H_0 40
6.2	Comparability of English and Vietnamese rankings..... 41
7.1	A model of UR selection in SLA..... 51
8.1	Recursive ranking: evidence for two concurrent grammars..... 55
8.2	A model of backsliding..... 55
8.3	Ranking _{L1} as a potentially the new H_0 56

CHAPTER 1

INTRODUCTION

1. 1 Introduction

‘A perennial issue in the study of second-language acquisition is the relative contribution of transfer of aspects of the L1 grammar to L2 versus direct influences of UG on L2’.
(McCarthy 2002:213)

Second-language acquisition (**SLA**) has been an ongoing topic of research in generative linguistics for over thirty years. However, Optimality Theory’s (**OT**) (Prince and Smolensky 1993) application to SLA has occurred only very recently. McCarthy (2002:213) observes that traditional approaches to (SLA) reflect two disparate viewpoints: those analyses that consider language transfer, or the native L1, to be the primary influence (Lado 1957) and those that consider innate conditions on the initial structure of a grammar to be paramount (Wode 1984). This thesis presents a theory of the process of L2 acquisition in OT terms. It concludes that only the former approach is tenable: SLA is purely a result of language transfer; innate linguistic universals have no direct influence of L2 acquisition.

1. 2 The proposal of this thesis

‘One would be completely justified in hypothesizing ... the existence of a separate linguistic system based on the observable output which results from a learner’s attempted production of the [target language] norm’.
(Selinker 1972:214)

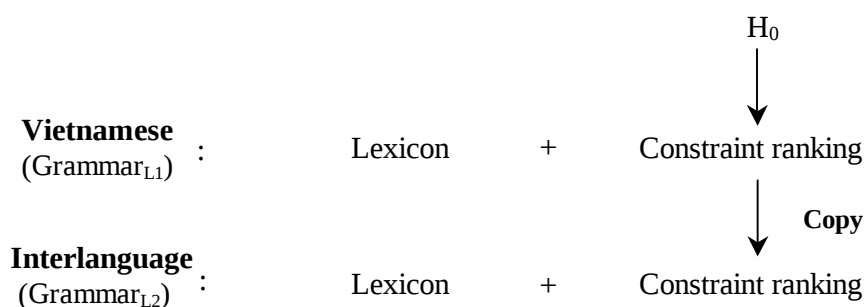
Selinker (1972:214) coined the term interlanguage to describe a linguistic system that is separate from both the native L1 (Grammar_{L1}) and the target L2 (Grammar_{L2}). There are two possible *direct* influences on the interlanguage: (1) the Grammar_{L1} (Smolensky, Davidson, and Jusczyk, to appear:23) and (2) the **Initial State (H₀)**; in OT, H₀ both favours unmarked structures and is a situation in which all markedness constraints outrank all faithfulness constraints (see ch.2§2.3.1). When there is no positive evidence to produce reranking, elements of H₀ *can* remain in Grammar_{L1} (see ch.2§2.4).

This thesis uses a corpus of elicited data concentrating on four Vietnamese speakers’ production of English coda consonant clusters to test both approaches introduced in §1.1. The data support the claim that SLA does not refer to H₀: the native grammar plays the only role in an OT account of SLA. Some effects of H₀ are still necessarily present but *only* as a consequence of language transfer. In other words, there is a transitive, or **emergent**, relationship between H₀ and Grammar_{L2} (see ch.4§4.3).

This thesis argues that both Grammar_{L1} and Grammar_{L2} must coexist in the minds of bilingual speakers. The key components of a grammar relevant to SLA are the **lexicon** and the **constraint ranking** (see ch.2§2.2). This thesis proposes that SLA constitutes a copying of the L1 constraint

ranking. This copied L1 ranking then forms the initial ranking of Grammar_{L2} (cf. Hancin-Bhatt and Bhatt 1997:359). The lexicon is not copied during SLA: the Vietnamese learner of English must create a new lexicon (see ch.7§7.3.2). In summary, Figure 1.1 illustrates that H₀ feeds the Vietnamese ranking, but crucially, the Vietnamese ranking forms the initial state of the interlanguage, Grammar_{L2}.

Figure 1.1: L2 acquisition as copy and reranking of the Vietnamese input



In a sense, this thesis proposes that each grammar resembles a **co-phonology** (Kager 1999:405 and Inkelaas 1998): an independent ranking that produces a different optimal candidate (see ch.2§2.2) from another ranking, despite having exactly the same input¹.

1.3 Evidence corresponding to the transfer hypothesis

This proposal predicts that outputs in the interlanguage that do not reflect the target language should *only* be a consequence of the Vietnamese ranking influencing the interlanguage forms. So, ‘errors’ are purely the result of ranking transference (see ch.4§4.4).

Unlike English, Vietnamese does not allow complex codas. When confronted with English words exhibiting complex codas, the consultants delete the final root consonant in 41% of cases (see ch.4§4.4.1). Table 1.1 provides a sample of the data that each of the Vietnamese consultants produced.

Table 1.1: Consonant deletion in the interlanguage

Gloss	Input	Output	Deletion
a. band	/bænd/	[bæn]	/d/ → [Ø]
b. hand	/hænd/	[hɛn]	/d/ → [Ø]
c. looks	/lʌk-s/	[lʌs]	/k/ → [Ø]
d. birds	/bɜd-z/	[bɜz]	/d/ → [Ø]

Vietnamese does not allow voiced obstruents to appear in the coda of a syllable. When confronted with English words exhibiting final voiced obstruents, the consultants devoice the final obstruent in 14% of cases (see ch.4§4.4.2). Table 1.2 provides a sample of the data that the consultants produced.

¹ Smolensky (1996b:2) refutes the claim that two concurrent grammars are possible. However, this is in the context of the comprehension/production dilemma (see ch.7§7.3.2), and is not tenable in SLA.

Table 1.2: Final obstruent devoicing in the interlanguage²

Gloss	Input	Output	Devoicing
a. kind	/kaɪnd/	[kaɪnt]	/d/ → [t]
b. gold	/gəʊld/	[gəʊlt]	/d/ → [t]
c. stand	/stænd/	[stænt]	/d/ → [t]
d. land	/lænd/	[lænt]	/d/ → [t]

1. 4 Evidence required to motivate access to the innate H₀

While banning complex consonant clusters and voiced obstruents from surfacing in the coda, Vietnamese necessarily shares with English the permissibility of codas in general. The proposal presented here means that it should be *impossible* for tokens in the interlanguage to occur without a coda: as Vietnamese and English share a ranking that permits codas, there can be no justification to claim that Vietnamese English learners delete codas because of pressure from their native grammar. In concrete terms, it should be impossible for a Vietnamese speaker to *ever* say *[kæ] for ‘cat’, [kæt].

If forms like this do occur, then it must be the case that the consultants have accessed H₀: syllables without a coda are universally unmarked compared to those with a coda. This prediction is correct: the consultants never did produce tokens such as *[bæ] and *[kɑ:] for ‘band’ [bænd] and ‘cards’ [kɑ:dz]. Furthermore, this thesis predicts that they should never do so when they are learning the English L2.

1. 5 Outline

In summary, this thesis provides a model of how speakers acquire a second language; it is organised as follows:

- *Chapter 2* introduces the mechanics of OT. It discusses how L1 acquisition is the consequence of ranking H₀. It also proposes that there is no inherent difference between L1 and L2 acquisition.
- *Chapter 3* presents a contrastive analysis of the phonologies of Vietnamese and English. It illustrates the way in which each language differs in relation to three sets of constraints. In particular, it shows how these constraints are ranked differently in each language. This provides an explanation as to why Vietnamese neither allows complex codas nor voiced coda obstruents, but English allows both.
- *Chapter 4* presents an analysis of the interlanguages of four Vietnamese speakers in the process of learning English. It provides evidence that language transfer, that is the maintenance of the Grammar_{L1} ranking, can account for all ‘errors’ in the production of a corpus of English tokens.

² Only words of the syllabic structure CVCC are included here (see ch.3§3.2).

- *Chapter 5* provides an explanation as to how individual variation can surface in the interlanguage. More specifically, it illustrates that variation is not a sign of theoretical weakness but a sign that reranking is in the process of occurring.
- *Chapter 6* presents an alternative hypothesis to that of Chapter 4: it tests whether or not learners of English have access to H_0 during language acquisition. This hypothesis is falsified: there is conclusive evidence to suggest that no access to H_0 is made.
- *Chapter 7* builds upon Tesar and Smolensky's (2000) learning algorithm by motivating an approach as to how constraint reranking occurs in the interlanguage. In addition, it illustrates that extending the work of OT loanword phonology is completely applicable to SLA.
- *Chapter 8* summaries and concludes the findings of the thesis. It also discusses a number of implications that the findings offer: for example, it addresses the issue of 'backsliding', illustrating that this could be evidence for the presence of two concurrent rankings in the mind of bilinguals.

1. 5. 1 Summary: leading ideas

In summary, this thesis proposes the following:

- *Leading Idea 1:* The interlanguage is a homogenous grammar.
- *Leading Idea 2:* The ranking of Grammar_{L1} is copied to form the initial ranking of L2.
- *Leading Idea 3:* All output forms in the interlanguage are a consequence of Grammar_{L1}.
- *Leading Idea 4:* A transitive relationship exists between H_0 and Grammar_{L2}.
- *Leading Idea 5:* No direct access to H_0 occurs in the acquisition of a second language.
- *Leading Idea 6:* There is no fundamental difference between L1 and L2 acquisition.

CHAPTER 2

THEORY

2. 1 Introduction

This section introduces the mechanics of OT that are important in the thesis. Section §2.2 introduces the basics of OT, §2.3 illustrates how a first language is acquired, and §2.4 provides both a conclusion and summarises a number of key ideas.

2. 2 The mechanics of an OT grammar

Figure 2.1 illustrates that an OT grammar is composed of three components (Kager 1999:19). The **lexicon** contains underlying representations of words that can serve as inputs to the grammar. The **generator (GEN)** receives inputs and produces an infinite number of surface forms, or **candidates**. The **evaluator (EVAL)** identifies a winner, or **optimal candidate** by referring to a hierarchy of ranked **constraints**. Constraints come in two types: **markedness (M)** and **faithfulness (F)**. Each type of constraint can assign **violations** to candidates that do not meet its requirement.

Figure 2.1: Basic OT architecture – (adapted from McCarthy 2002:10)

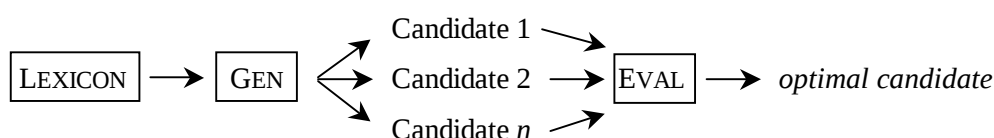


Tableau (1) provides another representation of Figure 2.1. It illustrates that given an input, two candidates, α and β , can both be potential optimal candidates. Constraints 1 and 2 select candidate α as optimal, shown by ‘***’. Even though candidate α incurs three violations ‘**’ of Constraint 2, this is of no importance: candidate β incurs a fatal violation ‘*!’ of Constraint 1 because it is higher ranked. The shading illustrates that those constraints are no longer relevant to the evaluation of a particular candidate. For example, Constraint 2 is no longer relevant to candidate β because Constraint 1 has already fatally ruled it out; Constraint 2 is also irrelevant to candidate α because of the nature of domination. This would not be the case if the ranking were to be reversed.

(1) Summarising the selection of an optimal candidate

INPUT	Constraint 1	Constraint 2
a. Candidate α		***
b. Candidate β	*!	

2.3 OT and first language learnability

‘A fundamental tenet in Optimality Theory ... is that a single invariant ranking of constraints represents the grammar of each language’.
(Fukazawa, Kitahara, and Ota 1998:1)

In order to evaluate the contribution that OT can make to SLA, it is first necessary to briefly introduce the way in which OT accounts for first language acquisition. This section of the thesis illustrates Tesar and Smolensky’s (2000) theory of acquisition of an L1. It highlights both the importance of the initial and final states and the reranking of constraints through positive evidence in the speech chain.

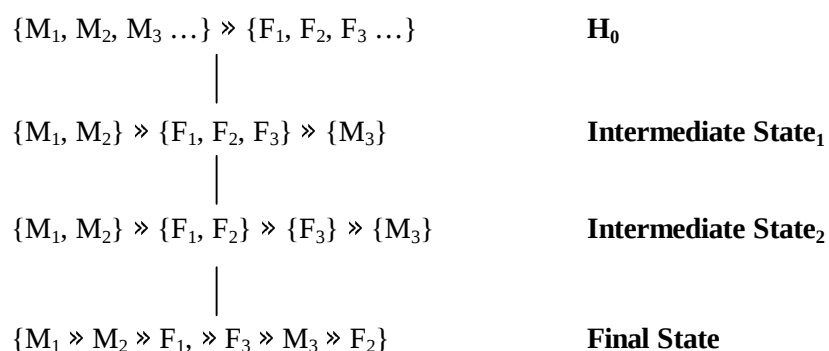
2.3.1 The initial and final states: language development

‘... let us ... confuse their language so they will not understand one another’
- (Genesis 10:7)

A language is a unique ranking of the members of **CON**. CON is a universal set of innate constraints (McCarthy 2002:11) (see §2.2). These constraints are present in **EVAL**. Before a language is acquired every markedness constraint dominates every faithfulness constraint (Smolensky 1996a:1). This ‘relatively’ unranked set of constraints is the initial state (H_0) (see ch.1§1.2). H_0 can be represented as: $\{M_1, M_2, M_3 \dots\} \gg \{F_1, F_2, F_3 \dots\}$. Besides acquiring lexical items, language acquisition is essentially constraint reranking. To move away from H_0 , some constraints must be **demoted** below others: $\{M_1, M_2\} \gg \{F_1, F_2\} \gg \{F_3\} \gg \{M_3\}$ (Tesar and Smolensky 2000 and Kager 1999:7). Constraints can only be reranked if there is positive evidence in the speech chain (see ch.3§3.2.1).

A language is acquired only when all member of H_0 are ranked in such a way that the developing grammar can account for all possible outputs of the language, regardless of the input: $\{M_1 \gg M_2 \gg F_1 \gg F_3 \gg M_3 \gg F_2\}$ (Smolensky 1996a:9). This resulting ranking, or acquired language, is the **final state** (Smolensky *et al.* to appear:19), in which all constraints are ranked³. Figure 2.2 summarises the relationship between H_0 and the final state. It also illustrates that intermediate rankings can exist from which outputs that are neither fully influenced by H_0 nor the target language occur (cf. ch.5§5.3).

Figure 2.2: Schematising first language acquisition in OT



³ Tableaux indicating an unclear ranking do not mean that no ranking exists (see ch.4§4.4.2.1).

2. 4 Conclusion

This chapter has briefly introduced the mechanics of how a grammar selects an optimal candidate. It demonstrated the way in which H_0 *directly* influences first language acquisition: the constraints that constitute H_0 are the starting point for all grammars. Figure 2.2 also illustrated that the final state does not necessarily completely obscure H_0 : it is not always the case that the ranking of H_0 changes; the final state can reflect the ranking $[[M \gg F]]$ (see ch.3§3.2).

2. 4. 1 The status of L1 and L2 acquisition within OT

This thesis proposes that there is no fundamental difference between ‘the mechanics’ of first and second language acquisition. This proposal accords with Epstein, Flynn, and Martohardjono’s (1996:678) claim that the cognitive processes of child and adult language acquisition are ‘fundamentally similar in nature’. With this in mind, (2) presents a number of key ideas that are revealed throughout the thesis.

(2) Key ideas that capture the acquisition of a first language in OT

- *Key Idea 1:* An input ranking reranks to form a final state of acquisition (see ch.3§3.3)
- *Key Idea 2:* Intermediate stages of ranking exist which reflect both previous and subsequent stages of acquisition (see ch.4§4.4.4 and ch.5§5.4).
- *Key Idea 3:* The initial state can be present in the final state (see ch.4§4.4).

CHAPTER 3

CONTRASTING VIETNAMESE AND ENGLISH PHONOLOGY

3. 1 Introduction

‘Reranking is only allowed if there is *positive evidence* in the form of constraint violation in the optimal output’.
(Kager 1999:298)

The previous chapter of this thesis introduced both the initial and final states. It also illustrated that all markedness constraints dominate all faithfulness constraints in H_0 , $[[M \gg F]]$. This chapter expands on this notion and explains how Vietnamese and English choose to rank three sets of constraints that produce the syllabic structures of both languages. Some of these constraints continue to reflect H_0 , while others do not. Section §3.2.1 deals with complex codas, §3.2.2 deals with codas in general, and §3.2.3 deals with the specific consonants that can appear in the codas of Vietnamese and English.

3. 2 The syllabic structure of Vietnamese

Vietnamese syllables have the structure (C)(C)V(V)(C) (Thompson 1965:45). In other words, they must always have at least a nucleus with an optional onset or coda. Nuclei may be either monophthongs such as [æ], [e], and [u] or diphthongs such as [ai], [eo], [au]. Complex codas never occur: the native learner only hears simple codas in the ambient language (Hwa-Froelich, D., Hodson, B. W., and Edwards, H. T. 2002:265). (1) illustrates each of the syllabic structures in Vietnamese⁴.

(1) Syllabic paradigm of Vietnamese⁵

	Orthographic	Output	Gloss	
/V/:	‘o’	[o]	‘young girl’	(Đình-Hoà 1991:331)
	‘a’	[a]	‘sickle’	(Đình-Hoà 1991:1)
	‘e’	[ɛ]	‘to be shy’	(Đình-Hoà 1991:148)
/VV/:	‘ai’	[ai]	‘who’	(Hwa-Froelich <i>et al.</i> 2002:268)
	‘ao’	[ao]	‘pond’	(Hwa-Froelich <i>et al.</i> 2002:268)
	‘iu’	[iw]	‘to be soggy’	(Đình-Hoà 1991:204)

⁴ Words with complex onsets are comparatively rare (Nguyen 1987). Examples are trên [tɿen] meaning ‘on, or above’ (Hwa-Froelich *et al.* 2002:269) and words with the glide [w] as the second element (see §3.2.1.1).

⁵ This thesis provides no indication as to the tone of each word; it only provides the necessary segments.

/CV:/	‘de’	[je]	‘goat’	(Hwa-Froelich <i>et al.</i> 2002:269)
	‘da’	[za]	‘skin’	(Đình-Hoà 1991:83)
	‘ba’	[ba]	‘three’	(Đình-Hoà 1991:7)
/CVV:/	‘toi’	[tɔi]	‘I’	(Hwa-Froelich <i>et al.</i> 2002:268)
	‘beo’	[bɛo]	‘panther’	(Hwa-Froelich <i>et al.</i> 2002:268)
	‘sai’	[sai]	‘to be incorrect’	(Đình-Hoà 1991:381)
/CVC:/	‘tam’	[tæm]	‘toothpick’	(Hwa-Froelich <i>et al.</i> 2002:267)
	‘kem’	[kɛm]	‘ice-cream’	(Đình-Hoà 1991:205)
	‘lang’	[laŋ]	‘healer’	(Đình-Hoà 1991:233)
/CVVC:/	‘nong’	[nawŋ]	‘to invoke’	(Benson 1988:227)
/VC:/	‘an’	[an]	‘peace’	(Đình-Hoà 1991:2)
	‘it’	[it]	‘little’	(Thompson 1965:24)
	‘em’	[ɛm]	‘to be soft’	(Đình-Hoà 1991:150)
/VVC:/	‘ông’	[ʌŋ]	‘Mister’	(Benson 1988:227)
	‘uoc’	[uək]	‘to desire’	(Đình-Hoà 1991:523)
	‘uom’	[uəm]	‘to unwind’	(Đình-Hoà 1991:523)

3. 2. 1 Coda complexity in Vietnamese and English⁶

Unlike English speakers, the Vietnamese learner never encounters complex codas in the ambient language (*but*, see §3.2.1.1 for a notable exception). To account for the lack of complexity in the coda, this thesis proposes a moraic account of syllabic structure. In this conception of the syllable (Hyman 1985), coda consonants are always ‘rendered’ heavy, or **moraic**. The activity of the **markedness** constraint WEIGHT-BY-POSITION (**WBP**) accounts for this, as (2) illustrates. This definition is from Sherer (1994), which in turn is based on Haye’s (1989:258) original rule-based formulation.

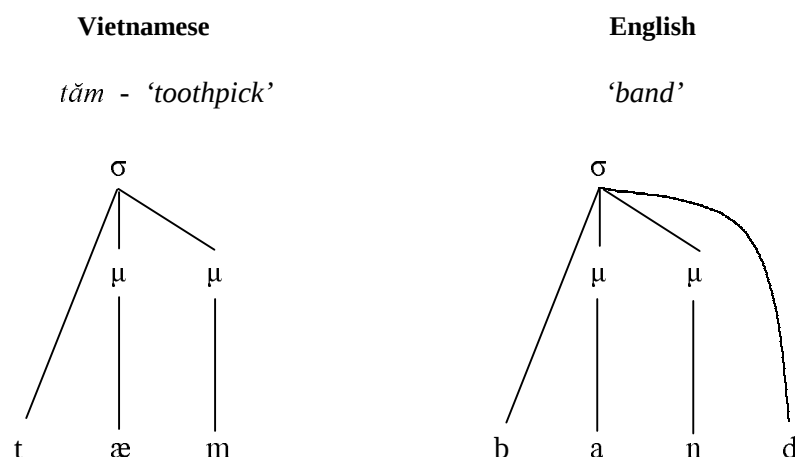
- (2) **Markedness:** WBP “Incur a violation for every coda consonants that is not moraic”
(Sherer 1994)

This thesis proposes that both Vietnamese and English *maximally* permit bimoraic syllables. The difference is that English allows output non-moraic consonants, while Vietnamese does not. In

⁶ The constraint *COMPLEX^{CODA} is not used because it is unnecessary and too general. This constraint predicts a **factorial typology** (Kager 1999:34), in which both deletion *and* epenthesis occur in 25% of cases. This does not occur: epenthesis accounts for only 1% of the data, /mʌnθ/ → [mʌnəθ]. This apparent lack of epenthesis mirrors Sato (1984:52). Owing to the nature of CON, *COMPLEX^{CODA} should still be present, though. This thesis proposes two considerations: 1/ a reconsideration of the nature of *COMPLEX^{CODA} and 2/ its effects mirror [[WBP » MAX]] in most cases, but are inadequate for mappings such as /ka^ur^und/ → [ka^ur^u] (see ch.4§4.4.1).

Vietnamese, both a vowel and single coda consonant each receive a mora. This satisfies both WBP and the bimoraic requirement of Vietnamese. In English, the final consonant of a cluster remains non-moraic, but importantly, the syllable still satisfies the bimoraic requirement of English. Figure 3.1 illustrates a Vietnamese syllable with the structure CVC and an English syllable of the structure CVCC, in which /CVC/ → [CV^μC^μ] in Vietnamese and /CVCC/ → [CV^μC^μC] in English⁷.

Figure 3.1: Moraic structure: Vietnamese and English syllabification



To account for this distinction, this thesis proposes that in Vietnamese, WBP dominates MAX. MAX is a **faithfulness** constraint that preserves input and output syntagmatic structure, as (3) illustrates. This means that in relation to this pair of constraints, Vietnamese maintains H_0 : [(**M**) WBP » (**F**) MAX].

- | | | | |
|-----|----------------------|-----|--|
| (3) | Faithfulness: | MAX | “Incur a violation for every input segment that does not have an output correspondent”.
(Prince and Smolensky 1993) |
|-----|----------------------|-----|--|

This ranking also means that even if **freedom of analysis** (McCarthy 2002:8) allows GEN to produce candidates with complex consonant clusters in the coda, only a single consonant will survive. Tableau (4) also illustrates that an underlyingly complex coda posited by richness of the base (**ROTB**) (McCarthy 2002:70) cannot faithfully map to the surface: consonant deletion must occur.

⁷ This thesis proposes that the moraic structure of vowels is available in the underlying representation (see Broselow and Park 1995:158 and ch.7§7.3.1). Identity between underlying and surface moraic structure is captured by IDENTMORA[Vowel] (Morén 1997:7). This constraint, although not included in the analysis, must be high ranked, as all the speakers faithfully produce moraic structure, though there are cases in which the quality of the vowel is unclear. No identity exists between the input and output moraic structure of consonants (cf. Morén 1997:7): no matter the moraic structure of an input, markedness will always determine the output (cf. McCarthy 2002:74). For example /ba^μn^μd^μ/ will always map to [ba^μn^μd] in English, as tableau 8 illustrates.

(8) $[[*TRIMOR \gg WBP]]$: no trimoraic syllables in English – ('band')

/bæ ^μ n ^μ d ^μ /	*TRIMOR	WBP	English
a. bæ ^μ n ^μ d		**	
b. bæ ^μ n ^μ d ^μ	*!	*	

3. 2. 1. 1 Coda complexity: the nature of diphthongs

Evidence to support the moraic account of consonant deletion, as outlined above, is found in the Vietnamese treatment of diphthongs. Vietnamese allows the diphthongs /aɪ/ and /ɔɪ/ to only occur in open syllables (Benson 1988:226 and 227)⁸. In terms of moraic structure, Figure 3.2 illustrates that owing to bimoraic limitation and ROTB the input /kwa^μr^μn/ 'handle' cannot map to an output with a final consonant: it breaks the bimoraic maximal weight of Vietnamese.

Figure 3.2: The moraic structure of /aɪ/ - (quai - 'handle')

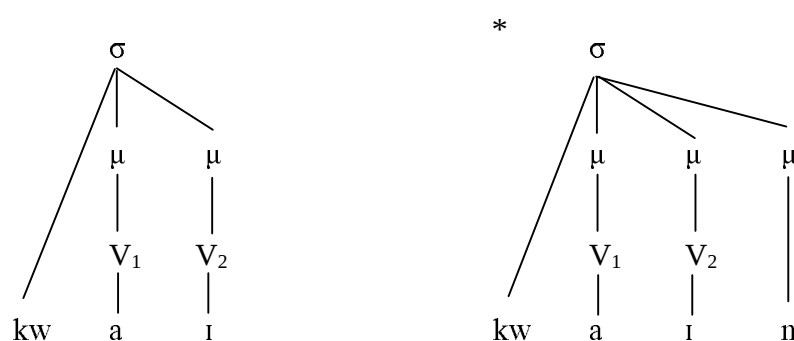


Tableau (9) further illustrates why /kwa^μr^μn/ 'handle' cannot map to its corresponding faithful output.

(9) ROTB and Vietnamese syllable weight: (quai - 'handle')

/kwa ^μ r ^μ n/	*TRIMOR	WBP	MAX	Vietnamese
a. kwa ^μ r ^μ			*	
b. kwa ^μ r ^μ n		*!		
c. kwa ^μ r ^μ n ^μ	*!		*	

In English, an input such as /ka^μr^μnd/ 'kind' always surfaces faithfully. As this thesis assumes a maximal bimoraic structure of English, it must be the case that the final coda consonants [n] and [d] are not moraic, as Figure 3.3 illustrates (cf. Ewen and van der Hulst 2001:152).

⁸ A solution that is not pursued is that a constraint such as $*[aɪC]$ is active. The disadvantage of this approach is that it seems to be a particular constraint to a language specific problem (McCarthy 2002:39).

Figure 3.3: The moraic structure of /kaɪnd/ - ('kind')

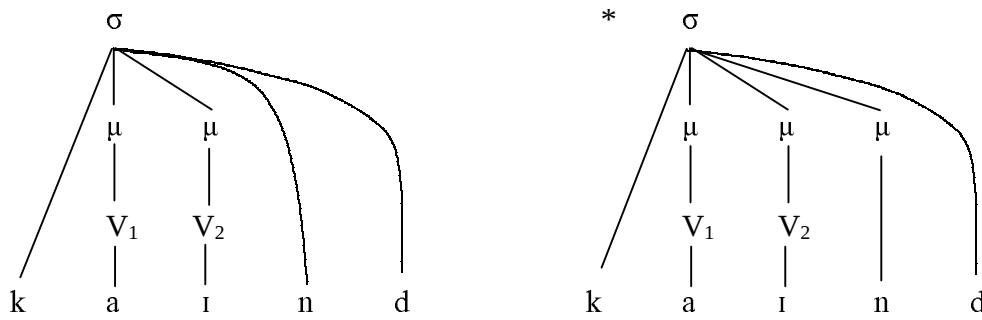


Tableau (10) illustrates why /ka^μɪ^μnd/ 'kind' could never be trimoraic or surface with deletion: [[*TRIMOR, MAX » WBP]] allows the non-moraic consonants [n] and [d] to survive in the output⁹.

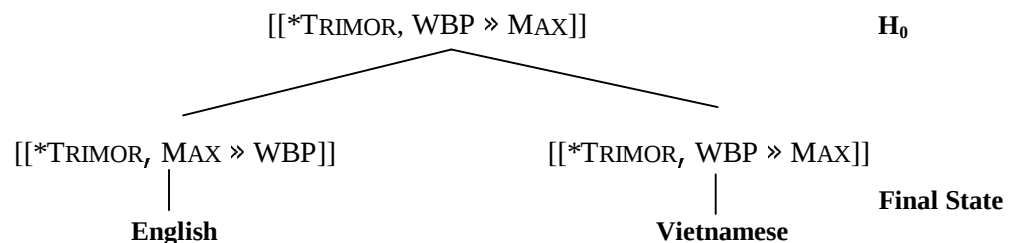
(10) English and the diphthong [aɪ]: ('kind')

/ka ^μ ɪ ^μ nd/	*TRIMOR	MAX	WBP
a. ka ^μ ɪ ^μ nd			**
b. ka ^μ ɪ ^μ n ^μ d	*!		
c. ka ^μ ɪ ^μ n ^μ		*!	

English

In conclusion, Vietnamese reflects H₀ with regards to banning both trimoraic syllables and syllables with non-moraic consonants: [[(M) WBP » (F) MAX]] and [[(M) *TRIMOR » (F) MAX]]. English mirrors Vietnamese in also banning trimoraic syllables¹⁰: [[(M) *TRIMOR » (M) WBP]]. However, it does not reflect H₀ in relation to WBP and MAX: surface true non-moraic consonants result from a reranking of H₀, [[(M) WBP » (F) MAX]] → [[(F) MAX » (M) WBP]], as Figure 3.4 summarises.

Figure 3.4: The constraint rankings of English and Vietnamese



⁹ Diphthongs with labial offglides are vowel + glide sequences in Vietnamese (Spencer 1996:31), eg. [aw]. The glide [w] is inherently non-moraic, so [aw] can appear with a coda consonant (Benson 1988:227): /nawŋ/ 'hot' → [nawŋ], not *[naw]. In other words, a complex coda can occur *iff* one consonant is non-moraic. English [aʊ] is necessarily bimoraic (Giegerich 1992:146).

¹⁰ This ranking contrasts with Vietnamese. Vietnamese bans trimoraic syllables because of [[*TRIMOR » MAX]]; English bans trimoraic syllables because of [[*TRIMOR » WBP]]. This situation shows HoT-HoP (see §3.2.3.1).

3. 2. 2 Coda surfacing in Vietnamese and English

As both Vietnamese and English allow coda consonants in the output, native speakers necessarily have access to positive evidence in their ambient languages that codas are permissible. To account for the surfacing of codas in both languages, it must be the case that MAX and DEP dominate NO-CODA. DEP, like MAX, is a faithfulness constraint preserving input and output structure; NO-CODA is a markedness constraint militating against codas, as (11) and tableaux (12) and (13) illustrate.

- (11) **Markedness:** NO-CODA “Incur a violation for every output with a coda”.
- Faithfulness:** DEP “Incur a violation for every output segment that does not have an input correspondent”.
- (Prince and Smolensky 1993)

- (12) $[[MAX, DEP \gg NO-CODA]]$: coda surfacing - (*tặm* - ‘toothpick’)

/tæm/	MAX	DEP	NO-CODA
☞ a. tæm			*
b. tæ	*!		
c. tæ.mə		*!	

Vietnamese

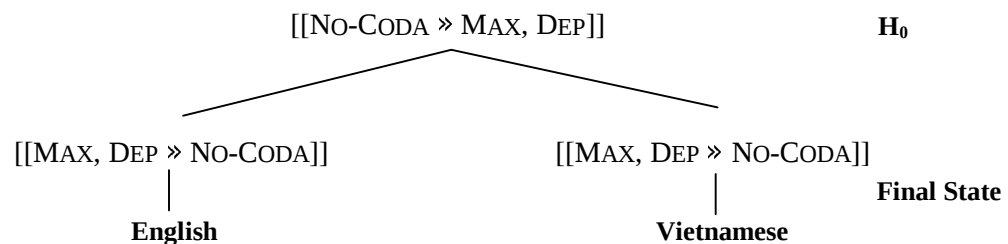
- (13) $[[MAX, DEP \gg NO-CODA]]$: coda surfacing – (‘time’)

/taim/	MAX	DEP	NO-CODA
☞ a. taim			*
b. tai	*!		
c. tai.mə		*!	

English

In conclusion, both Vietnamese and English must not reflect H_0 , as codas are allowed to surface faithfully. Figure 3.5 illustrates that the same reranking has occurred in both languages: $[(\mathbf{M}) \text{ NO-CODA} \gg (\mathbf{F}) \text{ MAX}, (\mathbf{F}) \text{ DEP}]] \rightarrow [(\mathbf{F}) \text{ MAX}, (\mathbf{F}) \text{ DEP} \gg (\mathbf{M}) \text{ NO-CODA}]$.

Figure 3.5: The constraint rankings of English and Vietnamese



3. 2. 3 Delimiting coda consonants in Vietnamese

Vietnamese only allows voiceless stops and nasal consonants to appear as legitimate coda consonants: [p], [t], [c], [k], [m], [n], [ɲ], and [ŋ] (Benson 1988:223). In other words, the Vietnamese grammar must account for the systematic gaps in its inventory. Owing to ROTB, even if a non-surface true consonant appears in the input, a faithful mapping cannot occur, as this section illustrates.

3. 2. 3. 1 Coda devoicing: Vietnamese and English

In the ambient language, the Vietnamese learner only hears voiced stops in the onset; coda stops can only be voiceless. To account for this voicing neutralisation in codas, this thesis follows Beckman (1998:25) in claiming that the **context-free** markedness constraint VOICED-OBSTRUENT-PROHIBITION (**VOP**) dominates IDENT(voice). VOP militates against voiced obstruents, and IDENT(voice) is a faithfulness constraint that preserves an input's specification for voice in the output, as (14) illustrates. This ranking continues to reflect H_0 : $[(\mathbf{M}) \text{ VOP} \gg (\mathbf{F}) \text{ IDENT(voice)}]$.

- (14) **Markedness:** VOP “Incur a violation for every voiced obstruent in the output” (Itô and Mester 1998:11)
- Faithfulness:** IDENT(voice) “Incur a violation for every input segment that is $[\alpha F]$ while its output correspondent is $[\beta F]$ ($\alpha \neq \beta$)”.

Voiced obstruents do surface in the onset. The **positional-faithfulness** constraint $\text{IDENT(voice)}^{\text{ONSET}}$ outranks VOP and blocks its effects, so showing a reranking of H_0 : $[(\mathbf{M}) \text{ VOP} \gg (\mathbf{F}) \text{ IDENT(voice)}^{\text{ONSET}}] \rightarrow [(\mathbf{F}) \text{ IDENT(voice)}^{\text{ONSET}} \gg (\mathbf{M}) \text{ VOP}]$, as both (15) and tableau (16) illustrate.

- (15) **Faithfulness:** $\text{IDENT(voice)}^{\text{ONSET}}$ “Incur a violation for every input segment in the onset that is $[\alpha F]$ while its output correspondent is $[\beta F]$ ($\alpha \neq \beta$)”. (Beckman 1998:26) & (Lombardi 1998)

- (16) $[(\text{IDENT(voice)}^{\text{ONSET}} \gg \text{VOP} \gg \text{IDENT(voice)})]$: devoiced coda obstruents - (*dép* - ‘beautiful’)

/dɛp/	$\text{IDENT(voice)}^{\text{ONSET}}$	VOP	IDENT(voice)
a. dɛt		*	*
b. dɛd		**!	
c. tɛp	*!		

Vietnamese

VOP also rules out an input from the rich base such as /deb/. This will always map to [dep]. Homogeneity of target/heterogeneity of process (**HoT-HoP**) (McCarthy 2002:25) also means that the

deletion of voiced obstruents also satisfies VOP (cf. Eckman 1981:28). However, a candidate with deletion is never optimal, and it must be the case that MAX outranks VOP, as tableau (17) illustrates. This ranking does not reflect H_0 : $[(\mathbf{M}) \text{ VOP} \gg (\mathbf{F}) \text{ MAX}] \rightarrow [(\mathbf{F}) \text{ MAX} \gg (\mathbf{M}) \text{ VOP}]$.

(17) $[[\text{MAX} \gg \text{VOP}]]$: devoicing not deletion in coda obstruents – (*dəp* - ‘beautiful’)

/dɛb/	IDENT(voice) ^{ONSET}	MAX	VOP	IDENT(voice)
a. dɛp			*	*
b. dɛ		*!		
c. dɛb			**!	

Vietnamese

The English learner does encounter outputs in which the voicing of stops is a contrastive feature in both onsets and codas. To account for this, it must be the case that VOP is demoted in the English grammar, as tableau (18) illustrates. This reflects a reranking of H_0 : $[(\mathbf{M}) \text{ VOP} \gg (\mathbf{F}) \text{ IDENT(voice)}, (\mathbf{F}) \text{ IDENT(voice)}^{\text{ONSET}}] \rightarrow [(\mathbf{F}) \text{ IDENT(voice)}, (\mathbf{F}) \text{ IDENT(voice)}^{\text{ONSET}} \gg (\mathbf{M}) \text{ VOP}]$.

(18) $[[\text{IDENT(voice)}^{\text{ONSET}}, \text{IDENT(voice)} \gg \text{VOP}]]$: voiced codas – (*bed*)

/bɛd/	IDENT(voice)	IDENT(voice) ^{ONSET}	VOP
a. bɛd			*
b. bɛt	*!	*	*
c. pɛt	*!	*	

English

MAX must also dominate VOP in English: an optimal candidate that vacuously satisfies VOP, but exhibits, consonant deletion cannot be optimal, as tableau (19) illustrates. As in Vietnamese, this ranking does not reflect H_0 : $[(\mathbf{M}) \text{ VOP} \gg (\mathbf{F}) \text{ MAX}] \rightarrow [(\mathbf{F}) \text{ MAX} \gg (\mathbf{M}) \text{ VOP}]$.

(19) $[[\text{MAX} \gg \text{VOP}]]$: voicing not deletion in codas – (*bed*)

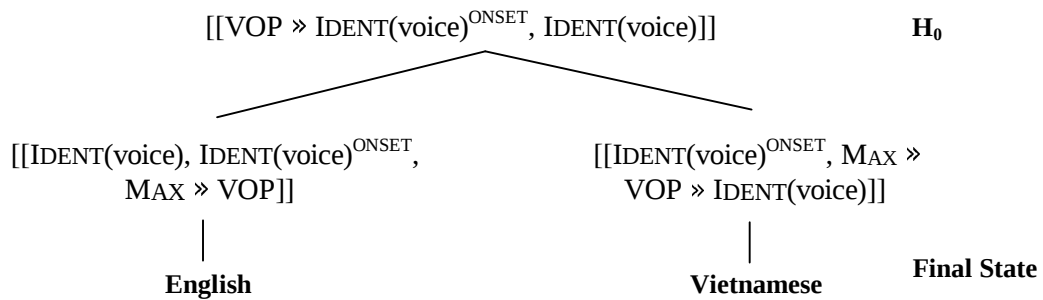
/bɛd/	IDENT(voice)	IDENT(voice) ^{ONSET}	MAX	VOP
a. bɛd				*
b. bɛ			*!	

English

3. 2. 3. 1. 1 Conclusion

Vietnamese reflects H_0 with respect to no voicing contrast in codas: $[(\mathbf{M}) \text{ VOP} \gg (\mathbf{F}) \text{ IDENT(voice)}]$. It does not reflect the ranking of H_0 in the voicing of onset obstruents: $[(\mathbf{M}) \text{ VOP} \gg (\mathbf{F}) \text{ IDENT(voice)}^{\text{ONSET}}] \rightarrow [(\mathbf{F}) \text{ IDENT(voice)}^{\text{ONSET}} \gg (\mathbf{M}) \text{ VOP}]$. In contrast, English reflects a reranking of H_0 in both the voicing of onset and codas: $[(\mathbf{M}) \text{ VOP} \gg (\mathbf{F}) \text{ IDENT(voice)}, (\mathbf{F}) \text{ IDENT(voice)}^{\text{ONSET}}] \rightarrow [(\mathbf{F}) \text{ IDENT(voice)}, (\mathbf{F}) \text{ IDENT(voice)}^{\text{ONSET}} \gg (\mathbf{M}) \text{ VOP}]$. Figure 3.6 summarises this section.

Figure 3.6: The constraint rankings of English and Vietnamese



3. 2. 3. 2 Continuants in Vietnamese and English

Vietnamese speakers never hear codas with any other consonant but nasals. This must mean that it bans all continuants in the coda. To prevent coda continuants from surfacing, *CONT must outrank IDENT(cont). *CONT is a context-free markedness constraint that militates against all consonantal continuants in the output; IDENT(cont) is a faithfulness constraint that preserves the input specification for manner, as (20) illustrates. This ranking reflects H₀: [[**(M)** *CONT » **(F)** IDENT(cont)]].

- (20) **Markedness:** *CONT “Incur a violation for every continuant segment in the output”
- Faithfulness:** IDENT(cont) “Incur a violation for every input segment that is [αF] while its output correspondent is [βF] (α ≠ β)”.

Vietnamese does not ban continuants in the onset. The positional-faithfulness constraint IDENT(cont)^{ONSET} outranks *CONT and blocks its effect, as (21) illustrates. This reflects a reranking of H₀: [[**(M)** *CONT » **(F)** IDENT(cont)^{ONSET}]] → [[**(F)** IDENT(cont)^{ONSET} » **(M)** *CONT]].

- (21) **Faithfulness:** IDENT(cont)^{ONSET} “Incur a violation for every input segment in the onset that is [αF] while its output correspondent is [βF] (α ≠ β)”.
(Beckman 1998:26) & (Lombardi 1998)

Tableau (22) illustrates that coda continuants in the input never surface, unlike in the onsets.

- (22) [[IDENT(cont)^{ONSET} » *CONT » IDENT(cont)]]: no [+cont] codas - (lên - ‘to go up’)

/lel/	IDENT(cont) ^{ONSET}	*CONT	IDENT(cont)	Vietnamese
☞ a. len			*	
b. lel		*!		
c. nel	*!			

HoT-HoP also dictates that the deletion of either a word initial or final [l] also satisfies *CONT. To militate against word initial [l] from being absent in the optimal candidate, MAX must dominate *CONT, even though there is no evidence in the ambient language. This reflects a reranking of H_0 : $[(\mathbf{M}) *CONT \gg (\mathbf{F}) MAX] \rightarrow [(\mathbf{F}) MAX \gg (\mathbf{M}) *CONT]$. Tableau (23) illustrates this ranking.

(23) $[[MAX \gg *CONT]]$: no deletion of initial [+cont] segments - (lên - ‘to go up’)

/lel/	IDENT(cont) ^{ONSET}	MAX	*CONT	IDENT(cont)
☞ a. len			*	*
b. le		*!	*	
c. en		*!		

Vietnamese

Continuants in the onset and coda surface faithfully in English. IDENT(cont) and IDENT(cont)^{ONSET} dominate *CONT, as tableau (24) illustrates. This ranking does not reflect H_0 : $[(\mathbf{M}) *CONT \gg (\mathbf{F}) IDENT(cont), (\mathbf{F}) IDENT(cont)^{ONSET}] \rightarrow [(\mathbf{F}) IDENT(cont), (\mathbf{F}) IDENT(cont)^{ONSET} \gg (\mathbf{M}) *CONT]$.

(24) $[[IDENT(cont)^{ONSET}, IDENT(cont) \gg *CONT]]$: [+cont] segments - (‘sell’)

/sɛl/	IDENT(cont) ^{ONSET}	IDENT(cont)	*CONT
☞ a. sɛl			**
b. sɛn		*!	*

English

Tableau (25) illustrates that MAX must also outrank *CONT in English. If this were not the case, [sɛl] would be suboptimal owing to its double violation of *CONT: /sɛl/ → [sɛl], not *[sɛ]. This reflects a reranking of H_0 : $[(\mathbf{M}) *CONT \gg (\mathbf{F}) MAX] \rightarrow [(\mathbf{F}) MAX \gg (\mathbf{M}) *CONT]$.

(25) $[[MAX \gg *CONT]]$: no deletion of [+cont] segments - (‘sell’)

/sɛl/	IDENT(cont) ^{ONSET}	IDENT(cont)	MAX	*CONT
☞ a. sɛl				**
b. sɛ			*!	*

English

3. 2. 3. 2. 1 Conclusion

Vietnamese reflects H_0 with respect to banning continuants in codas: $[(\mathbf{M}) *CONT \gg (\mathbf{F}) IDENT(cont)]$. It does not reflect the ranking of H_0 in onsets, as continuants do surface: $[(\mathbf{M}) *CONT \gg (\mathbf{F}) IDENT(cont)^{ONSET}] \rightarrow [(\mathbf{F}) IDENT(cont)^{ONSET} \gg (\mathbf{M}) *CONT]$. English reflects a reranking of H_0 in both onset and codas: $[(\mathbf{M}) *CONT \gg (\mathbf{F}) IDENT(cont), (\mathbf{F}) IDENT(cont)^{ONSET}] \rightarrow [(\mathbf{F}) IDENT(cont), (\mathbf{F}) IDENT(cont)^{ONSET} \gg (\mathbf{M}) *CONT]$. Figure 3.7 summarises the proposal of this section.

In conclusion, to acquire English from an input Vietnamese grammar (see ch.1§1.2), the Vietnamese learner must rerank three sets of constraints in order to produce faithful English codas. In this sense, learning a second language is simply moving from one grammar to the next, as Table 3.1 illustrates¹¹.

Table 3.1: Constraint ranking: moving from Vietnamese to English

Rankings - H ₀	Vietnamese	English	Comment
*TRIMOR ₁ , WBP ₂ » MAX ₁	M ₁ , M ₂ » F ₁	M ₁ , F ₁ » M ₂	± Coda Complexity
VOP » IDENT(voice) ₁ , IDENT(voice) ₂ ^{ONSET}	F ₂ » M » F ₁	F ₁ , F ₂ » M	± Obstruent Voicing
*CONT » IDENT(cont) ₁ , IDENT(cont) ₂ ^{ONSET}	F ₂ » M » F ₁	F ₁ , F ₂ » M	± Continuant Surfacing

¹¹ Note: [[NO-CODA » MAX, DEP]] is not included here, but is discussed further in ch.6.3.

CHAPTER 4

VIETNAMESE RANKING_{L1}: THE INPUT TO RANKING_{L2}

4. 1 Introduction

This chapter demonstrates that *all* outputs in the interlanguage are a consequence of a copying of the Vietnamese ranking (see ch.1§1.2): outputs in the interlanguage are predictable from the constraint rankings introduced in ch.3§3.2. Section §4.2 introduces the experimental methodology and procedure used to test this claim, §4.3 explains the transitivity, or the emergence, of H_0 in the interlanguage, §4.4 provides empirical justification for language transfer, and §4.5 summaries the findings.

4. 2 Theoretical procedure and methodology

This section introduces the theory and methodology of the empirical argumentation adopted in this thesis. It draws its data from four native speakers of Vietnamese. All are students at Bellerbys College, Cambridge: **B** is aged 19 and comes from Hanoi. He has only been learning English for one year, and had no formal instruction in Vietnam. **D** is aged 20 and is also from Hanoi. He has been learning English for seven years, five of which were in Vietnam and two in England. **T** is aged 18 and comes from Ho Chi Minh City. She learnt English for three years in Vietnam and has been learning English here for one year. **H** is aged 17 and also comes from Ho Chi Minh City. He learnt English for two years in Vietnam but only arrived in England six months before he took part in this study.

4. 2. 1 Materials and Procedure

All consultants were recorded on a Panasonic SJ-MR200 MiniDisc digital recorder, using a plug-in electrical microphone. To increase the likelihood of recording as near natural speech as possible, a meeting was arranged with each consultant one week prior to the recording session. This enable the consultants to become comfortable with me and to understand the nature of the task required. Each recording session was carried out in empty classroom at the school. All recording sessions lasted approximately thirty minutes, during which the participants had two tasks to perform.

It should be made clear that the corpus includes data of a distinct form: it only contains complex codas ending in voiced obstruents; it does not investigate tokens such as ‘plant’ and ‘think’, in which the second consonant is a voiceless plosive. The reason for this is as follows: final voiceless consonants in Vietnamese are always unreleased (Hwa-Froelich *et al.* 2002:266). Impressionistically and, to some extent, spectrographically mappings such as /θmk/ → [θm] ‘think’ did occur. However, to present the

most constrained and accurate set of data, these are not discussed further: the focus is on voiced codas, as it is clear to see if the deletion or devoicing of a voiced stop occurs or not.

Task I

The first task centred primarily on elicitation. A PowerPoint presentation was created in which each slide contained a different picture from which the target word could be elicited. For example, the word 'sing' was elicited with a slide showing a picture of a singer on stage. Each speaker was also asked to provide as much information that they could about each picture; this proved an extremely successful method of data collection. An advantage of this approach was that it produced both naturalistic speech and constrained the token production of each consultant.

Task II

To be sure that the recording sessions produced the required tokens, PowerPoint was used to create thirty-six slides, each of which contained a carrier sentence that the speakers were asked to read both in a casual speech style and at a 'normal' pace. Each carrier sentence embedded the target word preceding a vowel, before a consonant, and at the end of a word. This provided a controlled linguistic environment in which any variability that may have resulted from context could be accounted for. This method was intended primarily to act as a control.

In summary, the following sections of the chapter provide evidence for the transfer hypothesis using data elicited from four Vietnamese consultants during Tasks I and II.

4. 3 The emergence of the unmarked in the interlanguage

'A less noticed phenomenon is TETU in second-language acquisition'.
(McCarthy 2002:212)

Constraints in OT are present in every grammar, so contrasting with rule-based approaches to phonology in which a rule is either present or not. The effects of constraints may always surface in some environment, but in others, they can be covertly influential, thus having an emergent effect. This insight is not new: **Natural Phonology** (Stampe 1972) proposes that to learn a language simply involves learning not to apply certain processes that affect segmental material (Nathan 1984:107).

As discussed in ch.3§3.2.3.1, Vietnamese learners never encounter voiced final stops in the ambient language. This means that there is never any need to suppress the process that devoices them (Nathan 1984:109). In other words, VOP is present in the Vietnamese grammar, but there is never any evidence to rerank it below IDENT(voice). A strong prediction results from this fact: when learning English, the Vietnamese speaker necessarily encounters outputs that violate VOP. However, as VOP still continues to reflect H₀, [[**(M)** VOP » **(F)** IDENT(voice)], final voiced obstruents cannot survive in

the interlanguage and must device. McCarthy and Prince (1994) refer to this as the emergence of the unmarked (**TETU**): candidates that do not violate a particular markedness constraint, in this case VOP, should **emerge** as optimal; these are **unmarked** in relation to their respective constraint.

The following section of the thesis introduces the empirical predictions that are necessary to provide evidence for TETU, or the transfer of the Vietnamese ranking to Grammar_{L2} (see ch.1§1.3). Specifically, it predicts that three interlanguage rankings can be a consequence of residual processes that the native Vietnamese speaker has never had evidence to suppress (Nathan 1984:111).

4. 3. 1 Predicting TETU: WBP in the interlanguage

Vietnamese does not allow non-moraic codas because of $[(\mathbf{M}) \text{ WBP} \gg (\mathbf{F}) \text{ MAX}]$ (see ch.3§3.2.1). English does allow non-moraic codas because of the ranking $[(\mathbf{F}) \text{ MAX} \gg (\mathbf{M}) \text{ WBP}]$. If the input /bænd/ is fed into the interlanguage EVAL, consonant deletion should occur: /bænd/ → [bæn], in the same way that the Vietnamese grammar maps /tæmp/ to the output [tæm], not *[tæmp]¹². This agrees with White's (1996:745) claim that Grammar_{L1} forms the 'initial representation' of Grammar_{L2}.

4. 3. 2 Predicting TETU: VOP in the interlanguage

‘Speakers of Vietnamese and other such languages device final voiced obstruents in foreign words. For speakers who never encounter such words, the devoicing process remains merely a tacit restriction, but one which limits the universe of words which they might coin’.
(Donnegan and Stampe 1979:133)

As discussed in §4.3, Vietnamese has the ranking $[(\mathbf{M}) \text{ VOP} \gg (\mathbf{F}) \text{ IDENT(voice)}]$. English has the ranking $[(\mathbf{F}) \text{ IDENT(voice)} \gg (\mathbf{M}) \text{ VOP}]$, and accordingly, outputs with voiced coda obstruents occur. This means that the Vietnamese learner encounters inputs such as /bænd/. When this input passes through the Vietnamese ranking, devoicing should occur: /bænd/ → [bænt]¹³, in the same way as the Vietnamese input /dɛb/ maps to the output [dɛp], not *[dɛp] (cf. Eckman 1981:28).

4. 3. 3 Predicting TETU: *CONT in the interlanguage

As this thesis does not look at simple codas, evidence for the activity of *CONT is not available in words such as /bɪl/ ‘bill’, in which [l] has the potential to delete. Evidence is available in words such as /fɪlm/ ‘film’. If WBP militates against non-moraic codas in Vietnamese (see ch.3§3.2.1), the segments [l] and [m] both have the potential to be deleted. Because none of the constraints in ch.3§3.2.2 rule out [m], it should be the case that *CONT emerges, favouring a candidate without [l].

¹² This thesis assumes that the underlying representation is the same as in English, at least for the data under consideration. This is by no means an uncontroversial assumption (see ch.7§7.3.2) (cf. Silverman 1992).

¹³ It cannot be the case that deletion could satisfy VOP: $[(\mathbf{MAX} \gg \mathbf{VOP})]$ occurs in both English and Vietnamese.

4.3.4 Conclusion

The following section of the thesis demonstrates that these predictions are correct: consonant deletion, coda devoicing, and the preference for the deletion of [+cont] segments occurs in the interlanguage.

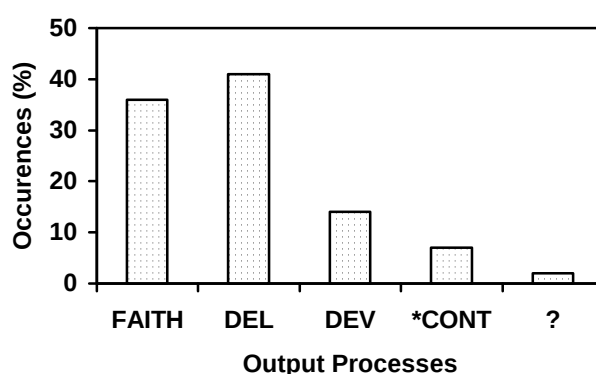
4.4 Results: evidence for language transfer

‘Intermediate grammars and their consequences, i.e. variation, are evident only where reranking is required ... the variable outputs in the intermediate grammars represent former and subsequent phases’.
(Adam 2002:43)

This section of the chapter introduces the results of both Task I and II concurrently. It introduces each of the above predictions in turn and provides empirical justification for their validity. In summary, section §4.4.1 introduces [[WBP » MAX]], §4.4.2 introduces [[VOP » IDENT(voice)]], and §4.4.3 provides evidence for [[*CONT » MAX]]. To be sure that devoicing and deletion occurred, each token was digitised and spectrographically analysed using Ladefoged and Maddieson (1996) as reference.

A total of 120 tokens constitute the corpus of data used in this section. Figure 4.1 provides a broad summary of the data that must be explained. It illustrates that: (1) *Faithful* mappings constitute 36% of the corpus, (2) *Deleted* consonants constitute 41% of the corpus, (3) *Continuant* deletion constitutes 7% of the corpus, (4) *Devoicing* of final obstruents constitutes 14% of the data, and (5) 2% of the data are anomalous cases ‘?’ (see ch.3§3.2.1, §4.4.2, and ch.6§6.5). The following sections of the chapter demonstrate that each of these phonological processes are *only* the effect of L1 transfer¹⁴.

Figure 4.1: Summarising the results: TETU and faithfulness in the interlanguage



4.4.1 Results: WBP and coda simplification in the interlanguage

Section §4.3.1 predicted that the interlanguage should display cases of coda simplification through consonant deletion: /CVC^uC/ → [CVC^u]. This can only occur if the consultants' rankings are not at a stage of 'native-like' competence, but rather, maintain [[WBP » MAX]]. This prediction is correct:

¹⁴ All the data that constitute Figure 4.1 can be found in the Appendix.

consonant deletion does occur in the interlanguage. This section illustrates deletion in monomorphemic inputs, and §4.4.1.1 illustrates that the same process occurs in bimorphemic inputs.

Deletion in monomorphemic inputs constitutes 23% of the corpus. 28 tokens show that deletion occurs from inputs such as /CVNC/, as Table 4.1 illustrates. This table also provides justification for the different moraic status of the diphthongs [aɪ] and [aw] (see ch.3§3.2.1.1): [aɪ] cannot occur with a following consonant because it is bimoraic; [aw] can because it is monomoraic.

Table 4.1: Syllabic structure and deletion in the interlanguage

Input	#Tokens	Output 1	Output 2
/CVNC ₁ /	5	CVN	---
/CAINC ₁ /	5	CVV	---
/CAIC ₁ C ₂ /	4	CVV	---
/ (C)AWC ₁ C ₂ /	14	AWC ₁ – 13	CAWC ₁ - 1

More specifically, Table 4.2 provides a sample of actual forms that all four consultants produced.

Table 4.2: Consonant deletion in the interlanguage

Gloss	Input	Output	Deletion	Occurrences
a. band	/band/	[ban]	/d/ → [Ø]	1
b. hand	/hand/	[hɛn]	/d/ → [Ø]	1
c. kind	/kamd/	[kaɪ]	/n/ → [Ø] /d/ → [Ø]	2

Tableau (1) clearly illustrates that in order to account for this data, it must be the case that WBP outranks MAX. This means that the initial Vietnamese ranking influences the interlanguage ranking.

(1) *[[WBP » MAX]] in the interlanguage: consonant deletion*¹⁵

/ba ^u nd/	*TRIMOR	WBP	MAX
a. ba ^u n ^u			*
b. ba ^u n ^u d		*!	
c. ba ^u n ^u d ^u	*!		
d. ba ^u			**!

Table 4.1 also illustrates that 5 tokens, 18% of the corpus, have the structure /CAINC/. With this in mind, example 4.2(c) ‘kind’ is special: not only does it illustrate the importance of the diphthong

¹⁵ §4.4.2.1 explains why the mapping /bæ^und/ → * [bæ^ud^u] does not occur.

[aɪ] as being bimoraic, but it also shows that deletion as a consequence of moraic content is crucial (cf. §4.4.2 and ch.6§6.4.2), even when a native segment appears in the input, as tableau (2) illustrates.

(2) *The emergence of [aɪ] in the interlanguage*¹⁶

/ka ^u ɪ ^u nd/	*TRIMOR	WBP	MAX
a. ka ^u ɪ ^u			**
b. ka ^u ɪ ^u n ^u d	*!		
c. ka ^u ɪ ^u nd		*!	
d. ka ^u ɪ ^u d		*!	

It is also clear how the data agree with Broselow, Chen, and Wang (1998:264), who argue for the predictive power of constraint rankings. They claim that in ruled-based theories it is unclear how ‘processes’ such as deletion surface in the interlanguage. In other words, neither English nor Vietnamese displays a process of phonological deletion, but this thesis predicts and accounts for their occurrence through constraint ranking and both a copying and reranking of Grammar_{L1}.

4. 4. 1. 1 TETU and morpheme realisation

‘A distribution that is mostly predictable from purely phonological criteria is overridden under specific morphological conditions’.
(McCarthy 2002:124)

The ranking [[WBP » MAX]] is overridden in one context: when the input consists of two morphemes, a root + affix (Matthews 1991:210), as Table 4.3 illustrates.

Table 4.3: Bimorphemic inputs and their mappings

Gloss	Input	Output	Deletion	Occurrences
a. words	/wɜ:d-z/	[wɜ:z]	/d/ → [Ø]	1
b. birds	/bɜ:d-z/	[bɜ:z]	/d/ → [Ø]	1
c. dogs	/dɒg-z/	[dɒz]	/g/ → [Ø]	1
d. hands	/hænd-z/	[hænz]	/d/ → [Ø]	1

In total, 22 bimorphemic tokens occur, thus accounting for 18% of the corpus. Neither the plural nor present tense affix ever deletes. This is not the case for root-final consonants, as Table 4.4 illustrates. The data also show that diphthongs ending in [ɪ], VI, and those ending in a glide [w], VW, behave different once again: VW tokens allow a coda consonant plus affix; VI tokens only allow an affix.

¹⁶ This datum shows that VOP does not always produces the same results as [[WBP » MAX]] (see §4.4.2). VOP can account for the deletion of the final consonant, but it cannot account for the deletion of the nasal.

Table 4.4: Bimorphemic inputs and deletion in the interlanguage

Input	#Tokens	Output
/CVC + C/	2	CV + C
/CVVC + C/	8	CVV + C
/(C)CVNC + C/	3	(C)CVN + C
/CVIC + C	1	CVI + C
/CVINC + C/	2	CVI + C
/CCVIN + C/	1	CCVI + C
/CVWCC + C/	1	CVWC + C
/CVWNC + C/	4	CVW + C

Samek-Lodovici's (1993) MORPH-REAL requires this morpheme realisation, as (3) illustrates.

- (3) **Faithfulness** MORPH-REAL “Incur a violation for every unrealised morpheme”
(Samek-Lodovici 1993)

MORPH-REAL overrides Vietnamese's requirement that non-moraic consonants delete. An input such as /w3:d-z/ ‘words’ maps to [w3:z] not *[w3:]. The affix must remain non-moraic, as *TRIMOR would rule out [z^μ] (see §4.4.1). This contrasts with a mapping such as /w3:d/ → [w3:], in which [[WBP » MAX]] is respected: the candidate *[w3:d] cannot be optimal. Tableau (4) illustrates that to account for the overriding of [[WBP » MAX]], it must be the case that MORPH-REAL dominates WBP¹⁷.

(4) *The emergence of MORPH-REAL in the interlanguage*

/w3 ^{μμ} d-z/	MORPH-REAL	WBP	MAX
a. w3 ^{μμ} z		*	*
b. w3 ^{μμ} dz		**!	
c. w3 ^{μμ} d	*!	*	*
d. w3 ^{μμ}	*!		**

Table 4.3 also shows that tokens such as ‘dogs’ and ‘hands’ display both deletion and the surfacing of the plural affix. In these cases, the affix [z] does receive moraic status, as tableau (5) illustrates.

¹⁷ WBP must outrank MORPH-REAL in H₀. Despite a lack of evidence in the corpus, this predicts that there should be cases in which the plural/singular affix does not surface: /w3^{μμ}d-z/ → [w3^{μμ}d] (cf. Honey 1987:240).

(5) *The emergence of MORPH-REAL in the interlanguage*

/hæ ^u nd-z/	MORPH-REAL	WBP	MAX
☞ a. hæ ^u nz ^u		*	*
b. hæ ^u z ^u		*	**!
c. hæ ^u n ^u dz		**!	
d. hæ ^u d ^u	*!	*	*

The ‘decisive’ activity of MORPH-REAL is a case of TETU: the effects of the constraint only emerge under pressure of deletion (cf. Broselow *et al.* 1998:272). The importance of treating the glide + vowel sequence [aw] as necessarily monomoraic in Vietnamese is clear in the following example (see ch.3§3.2.1.1). Tableau (6) illustrates that the input /paʊndz/ ‘pounds’ cannot surface faithfully. It also provides evidence for the ranking [[*TRIMOR » WBP]].

(6) *The emergence of [aw] in the interlanguage*¹⁸

/pa ^u ʊnd-z/	MORPH-REAL	*TRIMOR	WBP	MAX
☞ a. pa ^u wz ^u			*	**
b. pa ^u w ^u n ^u dz		*!		
c. pa ^u wn ^u dz			**!	
d. pa ^u wn ^u	*!		*	*
e. pa ^u w	*!		*	**

The use of MORPH-REAL also provides justification for this thesis’ assumption that learners of English can perceive all linguistic information in outputs (see Adam 2002:100 who argues that child learners can distinguish between bound and free morphemes). Consequently, there is a parallel between the mechanics of L1 and SLA, as ch.7§7.3.1 discusses further.

4. 4. 1. 2 Summary

In summary, this section has demonstrated that the Vietnamese ranking [[WBP » MAX]] survives in the interlanguage, Grammar_{L2}. It must be the case that the consultants display a stage of development in which the transitivity of H₀ necessarily means that WBP, a process for which there is no positive evidence in Vietnamese (see §4.3) emerges: complex codas do not surface. Table 4.5 illustrates all transfer rankings for which this section has provided accumulative evidence.

¹⁸ A disparity exists between the moraic structure of the English diphthong and the Vietnamese production. This is because in Vietnamese the constraint *[au] is active (cf. ch.3§3.2.1.1). This is not discussed further. Evidence for this constraint comes from the Peruvian language Axininca Campa: although allowing [aɪ], it does not allow [au] in its inventory. In other words, from the universal rich base, the grammar prevents [au] from surfacing.

Table 4.5: The extent of Vietnamese transfer in the interlanguage

Ranking	Language Influence	Comments
WBP » MAX	Vietnamese	Complex codas banned
*TRIMOR » WBP	Vietnamese	No 3 rd syllables
MORPH-REAL » WBP	Vietnamese	Morphemes are realised

4. 4. 2 Results: VOP and devoicing in the interlanguage

‘Stampe points out (1972) ... that Vietnamese speakers devoice final stops and fricatives in their English even when they can perceive the existence of final voiced stops in the mouths of native speakers’.
(Nathan 1984:109)

Section §4.3.2 predicted that the interlanguage should display cases of final obstruent devoicing in codas. Ch.3§3.2.3.1 also claimed that voiced obstruents never devoice in onsets. This is exactly the case: three consultants devoice only final stops in both mono and bimorphemic inputs on 16 separate occasions. This accounts for 14% of data in the corpus, as Table 4.6 illustrates, in which ‘D’ stands for a voiced obstruent and ‘T’ stands for a voiceless obstruent.

Table 4.6: Devoicing in the interlanguage

Input	#Tokens	Output
/CVD+D/	9	CVT + T
/CVVND/	1	CVVNT
/CVVC ₁ D/	2	CCVVC ₁ T
/ (C)CVND/	2	(C)CVNT
/VVC ₁ D /	2	VVC ₁ T

More specifically, Table 4.7 provides a sample of the actual forms that all three consultants produced.

Table 4.7: Final obstruent devoicing in the interlanguage

Gloss	Input	Output	Devoicing	Occurrences
a. kind	/kamd/	[kamt]	/d/ → [t]	1
b. gold	/gəuld/	[gəʊlt]	/d/ → [t]	1
c. stand	/stand/	[stant]	/d/ → [t]	1
d. land	/land/	[lant]	/d/ → [t]	1

Tableau (7) clearly illustrates that in order to account for coda devoicing, the consultants’ grammars must continue to reflect the Vietnamese ranking: [[M » F]] is still active in terms of coda voicing.

(7) Monomorphemic inputs and final devoicing

/gəʊld/	IDENT(voice) ^{ONSET}	VOP	IDENT(voice)
☞ a. gəwlt		*	*
b. gəwld		***!	
c. kəwlt	*!		

Two tokens provide further justification for the non-redundancy of $[[WBP \gg MAX]]$ to account for deletion: the inputs /lʊk-s/ and /taɪp-s/ have no final voiced obstruents. Tableau (8) illustrates that both candidates satisfy VOP, but deletion still occurs, thus reflecting the necessity of $[[WBP \gg MAX]]$ ¹⁹.

(8) Justification for $[[WBP \gg MAX]]$

/ta ^u r ^u p-s/	MORPH-REAL	WBP	VOP	MAX
☞ a. ta ^u r ^u s		*		**
b. ta ^u r ^u ps		***!		
c. ta ^u r ^u p	*!			

4. 4. 2. 1 Additional functions of $[[VOP \gg IDENT(voice)]]$

VOP also has the function of deciding between candidates in which a higher ranked, but usually decisive constraint, cannot decide. Section §4.4.1 illustrated how /bæ^und/ mapped to [bæ^un^u]. It did not explain why the mapping /bæ^und/ → [bæ^ud^u] cannot occur: Tableau (9) illustrates that VOP rules out *[bæ^ud^u]. This perfectly captures TETU: the low ranked VOP emerges as decisive when the higher ranked MAX cannot two decide between two candidates (McCarthy 2002:129).

(9) The emergence of VOP: candidate resolution

/band/	MAX	IDENT(voice) ^{ONSET}	VOP
☞ a. ba ^u n ^u	*		
b. ba ^u d ^u	*		*!

Kager (1999:21) claims that there may be cases in which a ranking argument is unclear. In cases like this, a speaker must make an arbitrary ranking decision. There is no evidence to rank VOP with respect to *CONT in English: the ambient language provides no motivation for a ranking (see ch.3§3.3). This means that when the Vietnamese speaker comes to learn English, an arbitrary choice is necessary. Tableau (10) illustrates that candidate B reranks the Vietnamese grammar and makes an

¹⁹ Consultant H produces the following mapping: /sa^uʊnd/ → [sa^uwt^u], which accounts for 1% of the data. While providing evidence for $[[WBP \gg MAX]]$, the current ranking cannot account for why [sa^uwn^u] is not optimal: both forms share equal violations of MAX. Further study into which constraint ‘emerges’ as decisive is clearly needed. More data is also needed to categorise this output as phonologically motivated.

arbitrary choice of ranking in the interlanguage, $[[VOP \gg *CONT]]$. This results in the preferential deletion of [d] over [l] in words such as [kəwld]. The converse prediction is clear: there should be cases in which Vietnamese speakers preferentially delete [d], though further data is obviously needed.

(10) *Coda simplification: interaction with VOP*

/kəʊld/	*TRIMOR	WBP	MAX	VOP	*CONT
a. kə ^u wl ^u		*			*
b. kə ^u wd ^u		*		*!	
c. kə ^u wl ^u d ^u	*!				

4. 4. 2. 2 Summary

In summary, this section has clearly demonstrated that the Vietnamese ranking $[IDENT(voice)^{ONSET} \gg VOP \gg IDENT(voice)]$ survives in the interlanguage. This shows that the transitivity of H_0 necessarily means that VOP emerges through TETU and becomes active. Table 4.8 illustrates the state of the interlanguage rankings that must exist in order to account for the devoicing data.

Table 4.8: The extent of Grammar_{L1} transfer in the interlanguage

Ranking	Language Influence	Comments
VOP $\gg$ IDENT(voice)	Vietnamese	Final obstruent devoicing
WBP $\gg$ MAX	Vietnamese	Coda consonants banned
MORPH-REAL $\gg$ WBP	Vietnamese	Morphemes are realised

4. 4. 3 Results: $[[MAX \gg *CONT]]$ in the interlanguage

Section §4.3.3 predicted that if Vietnamese has the ranking $[[*CONT \gg MAX]]$, it must be the case that the effects of this ranking are present in the interlanguage. This prediction is borne out in the data: consultant B and H delete [+cont] segments in preference to [-cont] segments on 8 separate occasions in total. This accounts for 7% of data in the corpus, as Table 4.9 illustrates.

Table 4.9: Continuant deletion in the interlanguage

Input	#Tokens	Output
/CVC ₁ N ₂ /	7	CVN
/CVNC ₁ /	1	CVVN

More specifically, Table 4.10 shows all forms in which consultants prefer to delete a [+cont] segment.

Table 4.10: Deletion as a consequence of *CONT in the interlanguage

Gloss	Input	Output	Deletion	Occurrences
a. film	/film/	[fim]	/l/ → [Ø]	7
b. lunch	/lʌntʃ/	[lʌn]	/tʃ/ → [Ø]	1

Tableau (11) illustrates that the consultants' grammars must continue to reflect the Vietnamese ranking $[(\mathbf{F}) \text{ MAX} \gg (\mathbf{M}) *CONT]$ to account for continuant deletion. Evidence is also provided for the fact that $\text{IDENT}(\text{cont})^{\text{ONSET}}$ outranks *CONT: [f] surfaces faithfully in the onset. Just like tableau (9), this example demonstrates TETU: the low ranked *CONT emerges as decisive.

(11) *The emergence of *CONT in the interlanguage*

/film/	WBP	$\text{IDENT}(\text{cont})^{\text{ONSET}}$	MAX	*CONT
a. $\text{fi}^{\text{u}}\text{m}^{\text{u}}$			*	
b. $\text{fi}^{\text{u}}\text{l}^{\text{u}}\text{m}$	*!			
c. $\text{fi}^{\text{u}}\text{l}^{\text{u}}$			*	*!
d. fi^{u}			**!	

4. 4. 3. 1 Summary

In summary, this section has demonstrated that the Vietnamese ranking $[*CONT \gg \text{MAX}]$ survives in the interlanguage. As before, the transitivity of H_0 means that *CONT, a suppressed process, emerges: coda continuants do not surface, as Table 4.11 illustrates.

Table 4.11: The extent of Grammar_{L1} transfer in the interlanguage

Ranking	Language Influence	Comments
WBP $\gg$ MAX	Vietnamese	Complex codas banned
$\text{IDENT}(\text{cont})^{\text{ONSET}} \gg *CONT$	Vietnamese	Continuants allowed in onsets
*CONT $\gg$ MAX	Vietnamese	No coda continuants

4. 4. 4 The hybrid interlanguage

Rather than simply providing evidence for language transfer in terms of individual processes, as §4.4 illustrated rather simplistically, the interlanguage also provides evidence that both English and Vietnamese processes can coexist to differing levels. Section §4.4.4.1 illustrates that two Vietnamese processes can coexist and §4.4.4.2 shows that a Vietnamese and a target English process also coexist.

4. 4. 4. 1 Multiple Vietnamese rankings in the interlanguage

Table 4.12 illustrates two data that provide evidence for the fact two Vietnamese processes coexist in the interlanguage. The effects of both final obstruent devoicing and consonant deletion are clear.

Table 4.12: Coexisting Vietnamese processes in the interlanguage

Gloss	Input	Output	Deletion	Devoicing	Occurrences
a. cards	/kɔd-z/	[kɔs]	/d/ → [Ø]	/z/ → [s]	1
b. kinds	/kaɪnd-z/	[kaɪs]	/d/ → [Ø] /n/ → [Ø]	/z/ → [s]	2

Tableau (12) shows that to account for devoicing of the final obstruent VOP must outrank IDENT(voice) (see §4.4.2). To account for consonant deletion, WBP must outrank MAX (see §4.4.1). Both these rankings reflect Vietnamese emergence in the interlanguage²⁰.

(12) *Coexisting Vietnamese processes in the interlanguage*

/kɔd-z/	MORPH-REAL	WBP	MAX	VOP	IDENT(voice)
a. k ^u ɔ ^u s		*	*		
b. k ^u ɔ ^u dz		**!			
c. k ^u ɔ ^u d	*!	*	*		
d. k ^u ɔ ^u	*!		**		
e. k ^u ɔ ^u z		*	*	*!	

In conclusion, Table 4.13 summarises the Vietnamese rankings that can coexist in the interlanguage.

Table 4.13: The extent of Grammar_{L1} transfer in the interlanguage

Ranking	Language Influence	Comments
WBP » MAX	Vietnamese	Complex codas banned
VOP » IDENT(voice)	Vietnamese	Final obstruent devoicing

4. 4. 4. 2 Vietnamese and English rankings in the interlanguage

Table 4.14 illustrates a number of cases in which complex codas surface faithfully in the interlanguage, but importantly, so does final devoicing.

Table 4.14: Coexisting Vietnamese and English processes in the interlanguage

Gloss	Input	Output	Devoicing	Occurrences
a. gold	/gəʊld/	[gəʊlt]	/d/ → [t]	2
b. old	/əʊld/	[əʊlt]	/d/ → [t]	2
c. dogs	/dɒg-z/	[dɒks]	/g/ → [k] /z/ → [s]	3

²⁰ Consultants actually differ in their production of [a], despite maintaining inherent length: consultant D produces this closer to [a]. The cause is purely dialectal, as Thompson (1965:37) suggests: ‘Hanoi a may be ... be viewed as intermediate between [[a]] and [[a]]’.

Tableau (13) illustrates that to account for both devoicing and the surfacing of a complex coda, it must be the case that MAX outranks both WBP and VOP and that VOP outranks IDENT (voice).

(13) *Monomorphemic inputs and final devoicing*

/gə ^u ʊ ^l d/	MAX	WBP	VOP	IDENT(voice)
a. gə ^u wl ^u t		*	*	*
b. gə ^u wl ^u d		*	**!	
c. gə ^u w	**!			

To account for the devoicing of the final stop and the plural morpheme in words such as ‘dogs’, /dɒg-z/ → [dɒks], it must also be the case that VOP dominates IDENT(voice), as tableau (14) illustrates.

(14) *Devoicing of the root final consonant and plural morpheme*

/dɒg-z/	MAX	WBP	VOP	IDENT(voice)
a. dɒ ^u k ^u s		*		**
b. dɒ ^u g ^u z		*	**!	
c. dɒ ^u k ^u z		*	*!	*

In sum, Table 4.15 shows the Vietnamese and English rankings that can coexist in the interlanguage.

Table 4.15: The extent of Grammar_{L1} transfer in the interlanguage

Ranking	Language Influence	Comments
MAX » WBP	English	Complex codas banned
VOP » IDENT(voice)	Vietnamese	Final obstruent devoicing

4. 4. 4. 3 Summary

In summary, this section has illustrated that the interlanguage is not simply a place in which Vietnamese ‘becomes’ English in a single transition: it evolves over time, in which both the presence of Vietnamese and English compete for supremacy, a point that ch.5 illustrates more clearly.

4. 5 Conclusion

This chapter presented an analysis of the interlanguage of four Vietnamese consultants learning English as an L2. It provided evidence for the validity of the following leading ideas (see ch.1§1.5):

- *Leading Idea 3:* All output forms in the interlanguage are a consequence of Grammar_{L1}.
- *Leading Idea 4:* A transitive relationship exists between H₀ and Grammar_{L2}.

Table 4.16 illustrates three sets of constraints that are essential in the transition from Vietnamese to English. However, as §4.4.4 illustrated, the interlanguage can, and indeed does, display a mixture of rankings: some continue to reflect Vietnamese; other reflect the target English ranking.

Table 4.16: Necessary rerankings in the acquisition of English

English targets	Vietnamese	English
Complex codas	WBP » MAX	MAX » WBP
Voiced final obstruents	IDENT(voice) ^{ONSET} » VOP » IDENT(voice)	IDENT(voice) ^{ONSET} , IDENT(voice) » VOP
Continuants surface	*CONT » MAX	MAX » *CONT

CHAPTER 5

VARIATION IN THE INTERLANGUAGE

5.1 Introduction

This chapter explores variation in the interlanguage. Broselow *et al.* (1998:209), in their study of the Mandarin interlanguage, state that outputs are far from stable: individual consultants not only differ in their production of outputs to other consultants, but on some occasions, a single consultant may produce different outputs from the same input. The results presented below support this conclusion. Section §5.2 introduces the nature of variation and §5.3 provides an interpretation of the results.

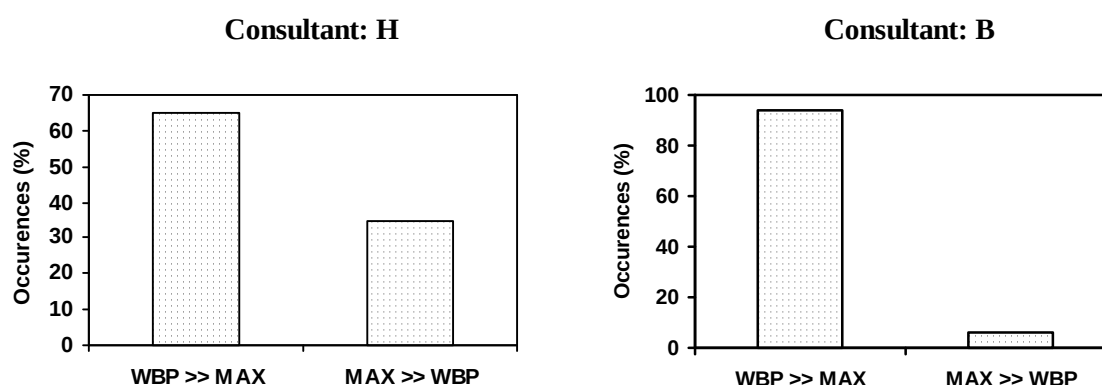
5.2 Variation: implications for OT as a theory of SLA

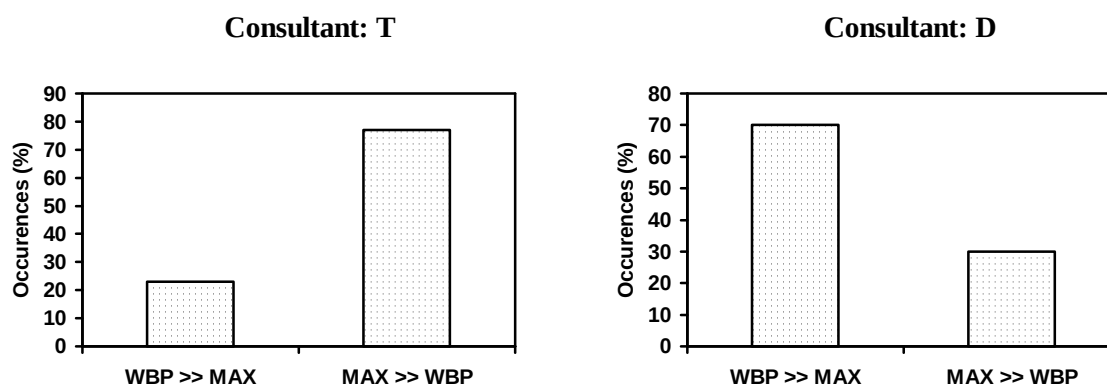
‘Intermediate grammars and their consequences, i.e. variation, are evident only where reranking is required ... the variable outputs in the intermediate grammars represent former and subsequent phases’.
(Adam 2002:43)

Faeter speakers often show variable deletion (Nagy and Reynolds 1995:151): a single speaker can produce the outputs [brok] and [brokəɫə] for the word ‘fork’. This behaviour is analogous to what occurs during SLA (Ellis 1985:84). However, Adam (2002:43) notes a crucial distinction: Faeter speakers allow long-term variation, but interlanguage variation lasts for a short space of time, in which the variation is the product of an unstable constraint ranking (Broselow *et al.* 1998:277).

This variation is also apparent in the present data corpus: taking faithfulness to the underlying input as displaying the maturity of a grammar, each consultant is often quite strikingly at a different stage of development. The data share Broselow *et al.*’s (1998:209) findings: Figure 5.1 illustrates that final consonants are both present and absent from each consultant’s tokens. This demonstrates that the ranking of WBP and MAX is in a state of flux. In other words, WBP and MAX have yet to be ranked.

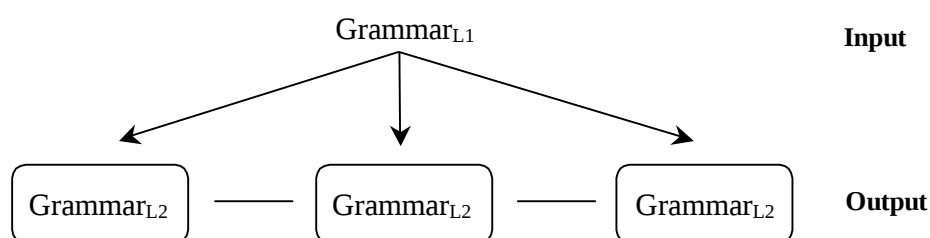
Figure 5.1: Consonant deletion: individual variation





It is this instability that both adds a degree of corroboration to claim that the interlanguage is an emergent ranking and one that has the greatest implication for OT as a theory of SLA: it raises the question as what is the status of each of the varied rankings. If one were to interpret classic OT literally, thus reiterating Fukazawa *et al.* (1998:1), it is necessary to claim that each ranking is a separate invariant grammar. Each grammar would then produce differing outputs as Figure 5.2 illustrates, in which multiple Grammar_{L2}s are available for access from a single input, Grammar_{L1}.

Figure 5.2: Invariant ranking and SLA - (adapted from Epstein *et al.* 1996:680)



However, a key phrase in Fukazawa's *et al.* (1998) account is 'a single invariant ranking'. The following section of the thesis proposes that, in addition to the theoretical nature of constraints, the interlanguage is not an invariant ranking. It shows that it is open to ranking variations. This both captures the predictive power of the model in Figure 5.2, but crucially, it retains a single Grammar_{L2}.

5.3 Interpretation and evidence for SLA

'A variable grammar is an intermediate grammar ... each case of constraint demotion (i.e. reranking) involves an intermediate phase, in which multiple outputs surface for the same target form'.
(Adam 2002:42)

Adam (2002:42) claims that multiple outputs are to be expected in an intermediate grammar. This prediction is accurate: consultant D produces very different outputs from the same input /ka^ur^und/, 'kind'. Tableau (1) illustrates that both [ka^ur^u] and [ka^ur^und] occur as a result of ranking variation between WBP and MAX. To get [ka^ur^u], [[WBP >> MAX]], but to get [ka^ur^und], [[MAX >> WBP]].

(1) *Consultant D and competing rankings*

/kamd/	WBP	MAX
☞ a. ka ^u ɪ ^u		**
☞ b. ka ^u ɪ ^u nd	**	

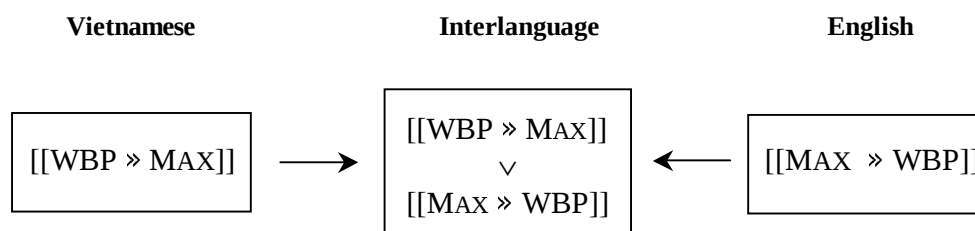
Tableau (2) provides further evidence that supports this claim. Although consultant D does not produce the form [læ^un^ud], he does produce the token [bæ^un^ud]. It is perfectly justifiable to expect that the former should occur, if further data were available. Because consultant D can produce either [læ^un^ud] or [læ^un^ut] from the input /læ^und/, it must be the case that the ranking of VOP and IDENT(voice) is in a state of flux. This means that positive evidence is available to claim that the Grammar_{1.2} of consultant D is in the process of reranking, as it moves towards the English target.

(2) *Reranking and target variability in the interlanguage*

/land/	MAX	WBP	VOP	IDENT(voice)
☞ a. la ^u n ^u t		*		*
☞ b. la ^u n ^u d		*	*!	

The proposed theory is crucial, as it provides evidence that the interlanguage is a place of transition, as well as perfectly capturing Selinker's (1972:214) initial proposal (Adam 2002:93). Figure 5.3 illustrates that an OT account of SLA actually expands the introduction that ch1§1.2 provided: the interlanguage is simply a ranking in a state of transition between the Vietnamese ranking and the target English ranking²¹. This not only illustrates the similarity between L1 acquisition and SLA, but it dispels any notion that the variability is 'haphazard' (Ellis 1985:84). Instead, variability is the product of constraint interaction and the settling of rankings.

Figure 5.3: The interlanguage in OT: ranking variation



5. 4 Conclusion

This chapter has demonstrated that speaker variability is evidence for constraint reranking in the interlanguage. Viewed holistically, the interlanguage does seem haphazard; however, approaching

²¹ The ranking of English is available in the perceived input, as ch.7§7.3.2 illustrates.

variability from sets of constraints reveals the true nature of variation: alternative outputs are purely the product of those constraints necessary to acquire faithful English codas, as Table 5.1 illustrates.

Table 5.1: Predicting interlanguage outputs

Vietnamese	English Target	Transitional Prediction
WBP » MAX	MAX » WBP	[ʃaɪ] → [ʃam]
*CONT » MAX	MAX » *CONT	[fim] → [film]
VOP » IDENT(voice)	IDENT(voice) » VOP	[lant] → [land]

The nature of knowing that only Vietnamese and English constraint rankings can exist in the interlanguage means that transitional predictions are possible: no form can be an optimal candidate in the interlanguage that is not the product of either the Vietnamese or English rankings, a point that the following chapter (ch.6) investigates in relation to direct access to H_0 .

CHAPTER 6

NO DIRECT ACCESS TO H_0

6. 1 Introduction

‘At no stage are we able to prove that what we now ‘know’ is true, and it is
always possible that it will turn out to be false’.
(Magee 1985:26)

Ch.4 demonstrated that an OT account of SLA could remove any conflict between language transfer and linguistic universals because of TETU: rankings in H_0 can appear in the L2. Ch.1§1.2 also suggested that there were two possible inputs to Grammar_{L2}. This chapter of the thesis follows Magee (1985:26) and considers the alternative to language transfer: that H_0 plays a *direct* role in SLA. According to the prediction in ch.1§1.4, it should be impossible for the Vietnamese consultants to produce forms in the interlanguage that are motivated by anything other than language transfer. Figure 6.1 illustrates a model of SLA that should not occur, in which H_0 directly influences Grammar_{L2}.

Figure 6.1: L2 acquisition as a result of direct access to H_0

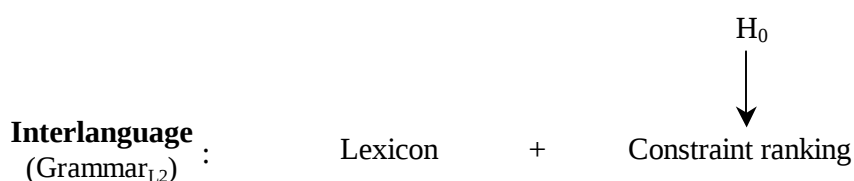


Figure 6.1 posits *no* difference between L1 and L2 acquisition: rather than L1 forming the input to the interlanguage, H_0 now forms the input, from which a reranking occurs (see ch.2§2.3.1). This contrasts with the model of SLA presented in ch.4§4.3 in which the ranking of Grammar_{L1} formed the input. If the transfer hypothesis is true, it should be the case that there is no evidence for direct access to H_0 , as this chapter demonstrates: section §6.2 presents the theoretical motivation of this approach, §6.3 explains the methodology used to test this hypothesis, §6.4 introduces the results, and §6.5 introduces a notable datum, and §6.6 concludes the findings of the chapter.

6. 2 Theoretical motivation

‘Like the child in L1 acquisition, the successful adult L2 learner is able to transform the universal grammar
into the structure of the grammar of the target language’.
(Ellis 1985:49)

Considering the direct influence of the innate in SLA is not new (Ellis 1985:49 and Klein 1986:23). Ch.2§2.3 illustrated that the cognitive process involved in L1 language acquisition is direct access to

H₀. Therefore, if ‘adult’ SLA is similar to L1 language acquisition, direct access to H₀ should occur. Three previous investigations are particularly pertinent to this thesis: Sato (1984), Hodne (1985), and Benson (1988). Both Sato (1984) and Benson (1988) focused on the syllabic simplification in the speech of Vietnamese learners of English; Hodne (1985) concentrated on potential simplification by Polish learners of English. Their motivation was to find out whether cases of simplification could be attributed to language transfer or the ‘unmarked situation’ that is afforded by H₀ (Kager 1999:94).

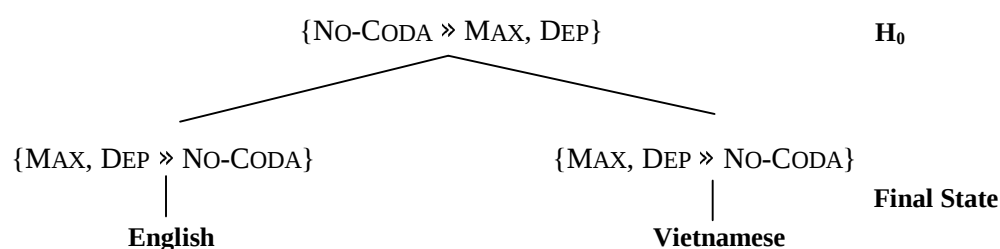
6.3 Experiment methodology and design

‘Speakers whose native language languages have some of the *same*, relatively complex syllable structures as those appearing the target language, and who *still* attempt to break those structures into simpler open syllables as they speak the interlanguage, would provide clear evidence that some process other than language transfer were operating’.
(Tarone 1980:143)

Tarone (1980:143) claims that in order to test the hypothesis that direct access to UG occurs during SLA, it must be the case that the native L1 has the same ‘relatively complex’ syllable structure as the target language. If there is a simplification towards a less marked syllabic structure when a speaker tries to acquire another language, then it is almost certainly the case that empirical justification for the effect of UG, or H₀, is present.

With this in mind, ch.3§3.2.2 illustrated that both Vietnamese and English allow simple codas to surface in their respective grammars: MAX and DEP both outrank NO-CODA. In other words, neither English nor Vietnamese continues to reflect the ranking of H₀ with respect to codas: [[**(M)** NO-CODA » **(F)** MAX, DEP]] → [[**(F)** MAX, DEP » **(M)** NO-CODA]], as Figure 6.2 reiterates.

Figure 6.2: Comparability of English and Vietnamese rankings



In addition, (1) illustrates that both English and Vietnamese allow syllables of the shape (C)(C)VN.

(1) Comparable syllabic structures of Vietnamese and English

Orthographic	Output	Gloss	
‘cân’	[kæɪn]	‘to weigh’	(Hwa-Froelich <i>et al.</i> 2002:267)
‘dêm’	[dɛm]	‘night’	(Hwa-Froelich <i>et al.</i> 2002:267)
‘trên’	[tɹɛn]	‘on, above’	(Hwa-Froelich <i>et al.</i> 2002:269)

‘âm’	[æm]	‘sound’	(Thompson 1965:30)
‘in’	[in]	‘to print’	(Thompson 1965:90)

The correct environment for an investigation into the role of H_0 in SLA is now formed. This means that language transfer cannot influence ‘potential’ consonant deletion (Tarone 1980:143). An input such as /fæn/ ‘fan’ should never map to *[fæ]. The only way for this mapping to occur, in which the coda has deleted, is if the ranking [[**(M)** NO-CODA » **(F)** MAX, **(F)** DEP]] occurs. This, as discussed above, cannot come from either English or Vietnamese: the only ranking source is H_0 .

6. 3. 1 Conclusion

This section has provided evidence for the comparability of Vietnamese and English in relation to coda surfacing. It illustrated that tokens of the form (C)(C)VN would either provide evidence for or disprove a possible access to H_0 during SLA: if the final nasal is deleted, then H_0 has been accessed.

6. 4 Experimental results

This section of the chapter investigates whether or not the unmarked CV syllabic structure is apparent during the acquisition of English words with the structure CVN and CVVN. This would be expected if the language learner had direct access to H_0 . Epstein *et al.* (1996:678) refer to this as **full-access**. Each consultant produced the required tokens during both Tasks I and II. Task II also contained ‘cloze’ sentences that targeted the production of the required tokens. Table 6.1 provides a sample of tokens produced in both the tasks. No differentiation is made as to the syntactic category.

Table 6.1: An example of nouns and verbs elicited

CCVN	CVN	VN
a. tram - /tɾam/	a. pen - /pɛn/	a. in - /ɪn/
b. skin - /skɪn/	b. man - /man/	b. on - /ɒn/
c. pram - /pɾam/	c. king - /kɪŋ/	c. an - /an/

The results share their findings with both Sato (1984) and Benson (1988). It is conclusive that none of the consultants simplify any complex cluster: the final nasal always occurs. Table 6.2 illustrates that all inputs with the target syllabic structure always surface faithfully: nasals are never deleted.

Table 6.2: Task I results: monosyllabic tokens of the structure (C)CVVN and VN

Input	#Tokens	Output
/ (C) CVN /	267	(C) CVN
/ VN /	98	VN

6. 4. 1 Conclusion

The data clearly indicate that there is no justification in claiming that the consultants have direct access to H_0 . Section §6.3 predicted that if access to H_0 did occur, it should be the case that the final consonant in an underlying representation of a simple coda deletes. This did not occur: there were no cases in which an underlying form such as /CVN/ surfaced as [CV], /bɪn/ ‘bin’ → [bɪn], not *[bɪ].

6. 4. 2 Language transfer and the innate: a differentiation

Benson (1988:228) claims that care must be taken not to draw any conclusions that the innate is playing a role when, in fact, it is purely the native language. Nowhere is this clearer than in the consultants’ production of words which have the underlying syllabic structure /(C)CVVN/, in which VV symbolises either a long vowel such as [ɜ:], or a diphthong such as [aɪ], as Table 6.3 exemplifies.

Table 6.3: Tokens with either long vowels or diphthongs

CCVVN	CVVN
a. dream - /dɪɪm/	a. farm - /fam/
b. plane - /pleɪn/	b. moon - /mun/
c. name - /neɪm/	c. shine - /ʃaɪn/

Faithfulness is not complete, though: Table 6.4 illustrates that deletion of the final nasal occurs in 9% of cases. This contrasts with those tokens above that exhibit only a short vowel and following nasal.

Table 6.4: Task I results: monosyllabic tokens of the form (C)CVVN

Input	#Tokens	Output 1	Output 2
/ (C)CVVN/	129	(C)CVVN - 117	(C)CVV – 12

Table 6.5 presents the data that display deletion; the final nasal does not surface in either token.

Table 6.5: Bimorphemic inputs and their mappings

Gloss	Input	Output	Deletion	Occurrences
a. shine	/ʃaɪn/	[ʃaɪ]	/n/ → [Ø]	6
b. nine	/naɪn/	[naɪ]	/n/ → [Ø]	6

This ‘apparent’ access to H_0 is merely the product of language transfer. The consultants have carried the Vietnamese ranking over to Grammar_{L2}: [[WBP » MAX]] rules out the coda consonant from

surfacing. The result is a false indication of access to H_0 , as tableau (2) illustrates²². These data also provide further justification for the moraic treatment of deletion that ch.3§3.2.1 introduced. This is because a constraint such as *COMPLEX^{CODA} could not predict deletion: /ʃam/ has a simple coda.

(2) [[WBP » MAX]]: the effect of H_0 access: ('shine')

/ʃa ^u ɾ ^u n/	*TRIMOR	WBP	MAX
☞ a. ʃa ^u ɾ ^u			**
b. ʃa ^u ɾ ^u n ^u	*!		
c. ʃa ^u ɾ ^u n		*!	

6. 5 Noting an intriguing case: is this access to H_0 ?

‘Thus the L2 learner brings two types of linguistic knowledge to the task of SLA: his knowledge of linguistic universals and the specific grammar of his L1’.
(Ellis 1985:201).

The above has proven that there is no simplification in syllables of the structure (C)(C)VN. It was concluded that no access to H_0 was made. However, a single token, which constitutes 1% of the data with complex codas (see ch.4), *does* allow ‘the possibility’ that access to H_0 is made during SLA. In this case, consultant D produces the output [gɾa^uw] from the input /gɾa^uɔ^und/, ‘ground’.

The motivation for this claim surrounds the proposal that [w] is non-moraic in Vietnamese (see ch.3§3.2.1.1). Tableau (3) illustrates that the Vietnamese ranking [[WBP » MAX]] predicts candidate (c) as optimal, a candidate with a moraic coda. However candidate (a), which has no coda, is actually the true optimal candidate. Therefore, even though WBP allows for a moraic consonant, none occurs.

(3) Predicting suboptimality

/gɾa ^u ɔ ^u nd/	WBP	MAX	VOP
☞ a. gɾa ^u w	*	**!	
b. gɾa ^u wn ^u d	**!		
☛ c. gɾa ^u wn ^u	*	*	
d. gɾa ^u wd ^u	*	*	*!

This data could be what Hodne (1985:412) describes as a ‘move toward simplification’. However, adopting this viewpoint means that [gɾaw] exists in a state for which the constraints posited in this

²² This thesis has not concentrated on vowel quality, but it is worth noting that the current analysis can handle vowel shortening. In the data, there are a number of ‘possible’ cases in which a vowel shortens: /si^un/ → [sɪ^un]. Therefore, it must be the case that IDENTMORA(SEG) is ranked below [[WBP » MAX]]. Further evidence is needed to produce a full analysis of this process. However, the fact that Vietnamese has no tense lax distinction with vowels such as [i] and [u] is also justifiable explanation (Hwa-Froelich *et al.* 2002:267).

cannot account. An alternative, more attractive, solution is to claim that consultant D has adopted a bimoraic treatment of [aʊ] (see ch.3§3.2.1.1). If this is the case, then the Vietnamese ranking [[WBP » MAX]] must have been retained in the interlanguage, thus producing deletion, as tableau (4) illustrates.

(4) *Optimality and moraic adaptation*

/gia ^u ʊ ^u nd/	*TRIMOR	WBP	MAX	VOP
a. gia ^u ʊ ^u			**	
b. gia ^u ʊ ^u nd		**!		
c. gia ^u ʊ ^u n ^u	*!			

6. 6 Conclusion

This chapter presented evidence for the following leading idea (see ch.1§1.5.1):

- *Leading Idea 5:* No direct access to H₀ occurs in the acquisition of a second language.

Justification to prove this point was provided by illustrating that there were no cases in which interlanguage coda deletion occurred that were not the consequence of language transfer (see §6.4). This chapter also illustrated that care must be taken in deciding whether access to H₀ is made or not. The outputs of ‘shine’ and ‘nine’ showed that what looks like the innate is purely language transfer (see §6.4.2). The chapter finished by presenting a datum that could possibly suggest access to H₀. No definite conclusions were made, but it is clear that further data are necessary (see §6.5).

CHAPTER 7

WHAT IS THE INPUT TO L2?

7. 1 Introduction

‘It must be assumed that there is a ‘single mechanism for learning languages’’.
(Ellis 1985:201)

Ch.4§4.3 made the assumption that the actual underlying representation (**UR**) posited by the Vietnamese learner in the interlanguage is same UR as that of the English target. This chapter argues that this must be the case. It also proposes that there is a single mechanism for learning languages in OT. As suggested in ch.2§2.3.1, the mechanism that this thesis assumes for language acquisition is Tesar and Smolensky’s (2000) Constraint Demotion Algorithm.

If L1 and L2 acquisition are comparable, this same learning process must be relevant for SLA. In terms of the interlanguage, Broselow *et al.* (1998:267) and Hancin-Bhatt and Bhatt (1997:359) claim that it will develop to a state that more closely resembles the target language.

As proven in ch.4 and ch.5, this is exactly the case: Vietnamese learners of English display constraint rankings that both reflect Vietnamese and the English target. However, Broselow *et al.* (1998) propose no motivation as to how the ranking of the interlanguage changes. The following chapter of thesis addresses this issue. It also illustrates a mechanism that motivates constraint reranking within the mechanics already available to OT (McCarthy 2002:208).

7. 2 SLA and underlying representations

‘The foreign underlying representations will come out looking like
the surface forms of the native language’.
Broselow *et al.* (1998:267)

The key theoretical motivation of Broselow *et al.* (1998:267) is the assumption that learners, during SLA, posit a determinable foreign UR (see also Eckman 1981:29). It must be made clear that this thesis is not claiming that other inputs from the rich base are not important: ch.3 illustrated that they clearly are, and must be considered. However, this chapter does claim that Vietnamese learners must select a determinate UR in order to motivate their acquisition of English. The following sections of the chapter take up this point and offer a motivation for UR selection and subsequent reranking.

7. 3 Insights from loanword phonology

‘The difference between first-language acquisition and loan phonology is thus that in child phonology Constraint Demotion will optimize harmony by changing the hierarchy’.
(Jacobs and Gussenhoven 2000:204)

A prevalent topic in loanword phonology surrounds the perception of potential foreign inputs (Peperkamp and Dupoux 2003). An understanding of perception is fundamental in the evaluation of a theory in which it plays the crucial role in ranking a grammar (see ch.3§3.2). (1) is taken from the data collection sessions used in this thesis. It indicates that at line 5 consultant B mispronounces the word *band*. This occurs immediately after the interviewer S provides the relevant token at line 4.

(1) Perception and underlying representations

- 1 B: They wear the like blue colour, and I think for the festival
- 2 S: What’s it called, this group of people who play instruments?
- 3 B: A Pearl Jam, yeah?
- 4 S: → A band - [bænd]
- 5 B: → Yeah, a ban -[bæn]

The crucial point is whether this disparity is a result of misperception or the Vietnamese ranking. This chapter argues that the mispronunciation is only the result of the Vietnamese grammar. The evidence to prove this point comes from Jacobs and Gussenhoven’s (2000) model of loanword phonology, as §7.3.1 introduces. Evidence to show that the misperception approach cannot be tenable comes from Silverman (1992) (see §7.3.3). The following sections introduce both alternatives in turn.

7. 3. 1 Jacobs and Gussenhoven (2000)

‘But do you *really* hear what I’m hearing? Can you hear the same song I do?’
The Fortress of Solitude
- Jonathan Lethem

Yip (2002:4) suggests that standard OT regards loanword phonology as ‘simply the host language grammar acting on the new foreign inputs’. It is this premise that essentially characterises Jacobs and Gussenhoven’s (2000:204) approach to both loanwords and their subsequent analogising to first language acquisition (Jacobs and Gussenhoven 2000:209). This approach, unlike Silverman (1992), assumes that a language learner perceives, or **parses**, all phonetic material. This also includes all phonological representations contained within the speech chain.

Best, McRoberts, and Goodell (2001:789) also report similar findings. They claim that listeners can perceptually discriminate non-native consonants, as long as they are similar to native forms. In terms of Vietnamese, this is clearly pertinent: ch.3§3.2.3.1 illustrated that while only allowing voiceless obstruents in the coda, Vietnamese does allow them in onsets. (2) shows this to be the case.

(2) Voiced obstruents in the onset of Vietnamese words

Orthographic	Output	Gloss	
ba	[bæ]	‘three’	(Hwa-Froelich <i>et al.</i> 2002:267)
bên	[bɛn]	‘side’	(Thompson 1965:23)
đeo	[dɛw]	‘to wear’	(Hwa-Froelich <i>et al.</i> 2002:269)
đẹp	[dɛp]	‘beautiful’	(Thompson 1965:24)
ga	[gæ]	‘railway station’	(Hwa-Froelich <i>et al.</i> 2002:269)
gân	[gæn]	‘be near’	(Thompson 1965:28)

If one follows this approach, then it must be the case that Vietnamese speakers can perceive the final voiced obstruent in a word such as /bænd/ ‘band’. It also seems completely untenable to suggest that they cannot perceive a segment that they can actually produce, although this approach makes the critical assumption that the perceptual relationship between a voiced coda and onset obstruent is the same, despite the fact that the Vietnamese speaker only hears voiced obstruents in the onset.

This opposes Hancin-Bhatt and Bhatt’s (1997:362) claim that deletion in codas may result from misperception. Gnanadesikan (1995:17) claims that the differences between a child’s performance and an adult’s performance has nothing to do with segmental difficulties in the perceptual input: what the adult produces, the child hears. Any disparity between adult and child forms is purely the product of markedness dominating faithfulness constraints, [[M » F]]. Evidence to support this approach is available in the corpus, as this section now illustrates.

Ch.4§4.4.4.1 showed that there are cases in which the plural affix can devoice in words such as ‘cards’: /kɑ:d-z/ → [kɑ:s] because of [[VOP » IDENT(voice)]]. This ranking also predicts the following mapping afforded by the rich base: /kɑ:d-s/ → [kɑ:s]. However, there are cases in the data that illustrate that there is something more to the relationship between root and affix than simply a rich base and constraint ranking. Tableau (3) shows that because the affix [z] is voiced in the output of consultant H’s production of ‘dogs’, it must be the case that [[IDENT(voice) » VOP]]. Tableau (4) makes the wrong prediction, though: ROTB provides the input /dɒg-s/ which maps to *[dɒs].

(3) Mapping underlying /z/ → [z]

/dɒg-z/	MAX	IDENT(voice)	VOP
a. dɒz	*		**
b. dɒs	*	*!	*

(4) Mapping underlying /s/ → *[s]

/dbg-s/	MAX	IDENT(voice)	VOP
☞ a. dbz	*	*!	**
☛* b. dɒs	*		*

The same pattern is also visible in root-final voiceless stops: consultant D produces the mapping /tʰɪp-s/ → [tʰɪs] for the word ‘types’, not /tʰɪp-s/ → *[tʰɪz]. In conclusion, it must be the case that both the root-final stop *and* the plural affix are posited in the input²³. This means that the Vietnamese speaker must be able to perceive the voiced stops and posit them in the lexicon’s UR, even though they do not surface because of [[WBP » MAX]]. This approach also justifies Tesar and Smolensky’s (2000) algorithm, which works under the proviso that the learner is confronted with ‘properly structured linguistic representations’ (Kager 1999:322). The following illustrates the mechanism as to how an adult output forms the input to the interlanguage constraint ranking.

7.3.2 Perception, production, and reranking

‘Reranking is only allowed if there is *positive evidence* in the form of constraint violation in the optimal output’.
(Kager 1999:298)

This thesis proposes that during SLA, the **perception** of a word like *band* results in the Vietnamese speaker delimiting the rich base to select the ‘optimal input’. This optimal input is selected by **lexicon optimisation** (McCarthy 2002:215). Lexicon optimisation selects a ‘determinate’ UR for the new interlanguage lexicon (see ch.1§1.2). Markedness constraints are of no use in the selection process: as there is only one output form, it does not compete with other perceptual candidates. Therefore, lexical optimisation must only rely on faithfulness constraints (McCarthy 2002:215). Tableau (5) illustrates that the perceived form [bæ^und] corresponds to a faithful UR, /bæ^und/. It also provides evidence for the ranking [[DEP » MAX]] in the Vietnamese grammar (see ch.3§3.2.2).

(5) Perception Parse: selecting an interlanguage underlying representation

Candidate Inputs	Perceived Output	WBP	DEP	MAX	NO-CODA
☞ a. /bæ ^u nd/	[bæ ^u nd]	*			*
b. /bæ ^u n/		*		*!	*
c. /bæ ^u n.də/		*	*!		*

²³ The exact status of this approach is not discussed further. To make this work, a constraint that links the voicing of the stop + affix in the underlying representation is necessary. It is also clear that additional considerations are necessary: it would be difficult to claim that the plural [əz] in ‘horses’ is related to the root-final obstruent [s].

The newly selected /bæ^und/ now acts as the ‘determinate’ input to GEN. GEN then produces a set of candidates in the usual manner, and EVAL selects the optimal candidate [bæ^un] (see ch.2§2.2). Tableau (6) shows that the **production** of this optimal candidate is purely the result of the Vietnamese ranking: [[WBP » MAX]] rules out a faithful mapping, /bæ^und/ → *[bæ^un^ud].

(6) *Production Parse: the potential for constraint reranking*

/bæ ^u nd/	WBP	MAX	NO-CODA
☞ a. bæ ^u n ^u		*	*
b. bæ ^u n ^u d	*!		*

Tableau (7) indicates that a faithful mapping of the perception [bæ^un^ud] is less **harmonic** than its corresponding production [bæ^un^u]. This difference between the harmony of what is perceived and what is produced forms the centre of Jacobs and Gussenhoven (2000:199) approach. It also forms the only motivation for constraint reranking in the interlanguage. In summary, the aim of SLA is to create equal harmony between perception and production. If this is not the case, constraint demotion occurs.

(7) *Motivating a constraint reranking*

/bæ ^u nd/	WBP	MAX	NO-CODA
☞ Production [bæ ^u n ^u]		*	*
Perception [bæ ^u n ^u d]	*!		*

A **comparative tableau** further motivates constraint reranking (McCarthy 2002:32). Tableau (8) illustrates the perceived input /bæ^und/ and the two candidates it produces: a faithful mapping [bæ^un^ud], which is labelled ‘A’, and an unfaithful mapping [bæ^un^u], which is labelled ‘B’. The faithful mapping [bæ^un^ud] can be called the **(W)inner**, as this is the English target output. It is the winner despite the fact that Tableau (6), at this stage of ranking, renders it suboptimal. The unfaithful mapping [bæ^un^u] can be called the **(L)oser**. It is the loser because this is not the target English form.

(8) *A comparative tableau motivating reranking*

/bæ ^u nd/	WBP	MAX	NO-CODA
(A) bæ ^u n ^u d ~ (B) bæ ^u n ^u	L	W	

The motivation behind reranking lies in the fact that every constraint favouring the loser, the non-target form, must be demoted below those favouring the winner. This means that for ‘A’ [bæ^un^ud] to beat ‘B’ [bæ^un^u], MAX has to dominate WBP (McCarthy 2002:203). The only way for this to arise is if constraint demotion occurs in the interlanguage. Tableau (9) illustrates that this ranking now matches

the English ranking: every *A*-favouring constraint now dominates every *B*-favouring constraint, and [bæ^un^ud] surfaces as the optimal candidate, in which the production and perception are now equally harmonic, as tableau (10) illustrates.

(9) *A comparative tableau illustrating the result of ranking*

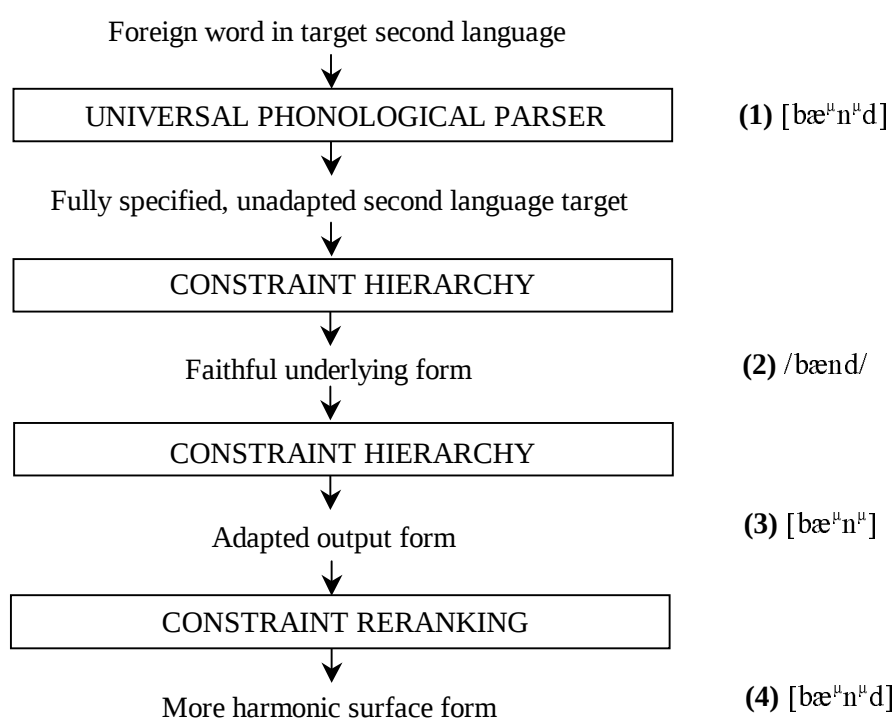
/bæ ^u nd/	MAX	WBP	NO-CODA
(A) bæ ^u n ^u d ~ (B) bæ ^u n ^u	W	L	

(10) *Equal harmony between perception and production*

/bæ ^u nd/	MAX	WBP	NO-CODA
☞ Production [bæ ^u n ^u d]			*
☞ Perception [bæ ^u n ^u d]			*

To summarise, the model of UR implementation proposed is that the Vietnamese learner perceives all segmental material in an English output, as Kager (1999:322) also suggests. From this output, they select the most harmonic UR. A faithful mapping from this UR, in the initial stages of acquisition, will be less harmonic than the produced output. This leads to reranking, as Figure 7.1 illustrates, in which annotation (1) illustrates the perceived L2 form, annotation (2) shows the underlying form, annotation (3) illustrates the adapted output owing to the Vietnamese ranking, and annotation (4) shows the result of reranking the Vietnamese grammar, an equally harmonic output.

Figure 7.1: A model of UR selection in SLA – (Adapted from Jacobs and Gussenhoven 2000:205)



Jacobs and Gussenhoven (2000:209) claim that ‘loan phonology is not a separate component of the grammar’. This section has illustrated that SLA is also not a separate part of the grammar but is constrained within the same framework as the acquisition of a first-language: constraint reranking.

7. 3. 3 Misperception and no motivation for reranking

Section §7.3 suggested that Silverman (1992) does not subscribe to the opinion that Vietnamese learners of English can perceive all the information in the speech signal. Silverman (1992:194) also describes the speech signal as ‘superficial’ and ‘lacking all phonological representation’.

Yip (2002:7) shares this view, claiming that Cantonese speakers cannot perceive the post-consonantal stop, [d], in the word ‘band’. This is relevant to extract (1), and necessarily means that the reason for consultant B’s mispronunciation is entirely owing to the fact that misperception has occurred.

7. 3. 3. 1 Falsifying this approach

This approach is not tenable for a theory of SLA: the Vietnamese learner must perceive all segmental material, as this chapter now demonstrates. If McCarthy’s (2002:215) process of UR selection is followed, then the perceived [bæ^un] must select the UR /bæ^un/, as tableau (11) illustrates.

(11) Selecting an underlying representation in Vietnamese

Candidate Inputs	Perceived Output	WBP	DEP	MAX	NO-CODA
☞ a. /bæ ^u n/	[bæ ^u n]	*			*
b. /bæ ^u nd/		*	*!		*
c. /bæ ^u n.də/		*	**!		

The determinate input /bæ^un/ now feeds GEN. EVAL produces a set of candidates, and the Vietnamese ranking [[WBP » MAX]] selects [bæ^un] as the optimal candidate, as tableau (12) illustrates²⁴.

(12) No potential for the ‘correct’ output

/bæ ^u n/	WBP	DEP	MAX	NO-CODA
☞ a. bæ ^u n ^u				*
b. bæ ^u n ^u d	*!			*
c. bæ ^u n ^u .də		*!		*

²⁴ DEP is necessary to rule out /bæ^un/ → [bæ^un^u.də]: the consonant [d] in the onset is necessarily non-moraic (Ewen and van der Hulst 2001:151).

Tableau (7) indicated that if production is less harmonic than perception, reranking must take place. This motivation cannot occur under an approach such as Silverman (1992): tableau (13) shows that both the produced optimal candidate [bæ^un^u] and the perceived form [bæ^un] are equally harmonic.

(13) *No motivation for a constraint reranking*

/bæ ^u n/	WBP	MAX	NO-CODA
Perception [bæ ^u n ^u]			*
Production [bæ ^u n ^u]			*

Comparative tableau (14) indicates that the faithfulness constraint MAX favours neither ‘A’ nor ‘B’.

(14) *A reranking comparative tableau*

/bæ ^u n/	MAX	WBP	NO-CODA
(A) bæ ^u n ^u d ~ (B) bæ ^u n ^u			

This means that the learner can never pronounce the optimal candidate [bæ^un^ud]. This is because there is simply no positive evidence in the harmony between production and perception: neither candidate violates any constraint (Kager 1999:298) and so no reranking can occur.

7. 4 Conclusion

‘Learners, under pressure from interlanguage data, begin to construct an interlanguage grammar in which the rankings of constraints may differ from the native-language ranking’.
Broselow *et al.* (1998:279)

This chapter provided a motivation for constraint reranking. It also illustrated the way in which a ‘determinate’ UR acts as the trigger to reranking. In conclusion, this motivation is a perfect representation of what Broselow *et al.* (1998:279) present as a model of SLA: the ‘pressure’ of perception/production reranks the constraints in the interlanguage.

CHAPTER 8

SUMMARY AND IMPLICATIONS

8. 1 Introduction

This chapter evaluates the findings of the thesis. It discusses how the thesis has met the leading ideas that ch.1§1.5.1 laid out, and as (1) reiterates. In addition, this chapter also suggests a number of consequences for the proposals that this thesis presented.

(1) *Leading Ideas - (repeated from ch.1§1.5.1)*

- *Leading Idea 1:* The interlanguage is a homogenous grammar.
- *Leading Idea 2:* The ranking of Grammar_{L1} is copied to form the initial of L2.
- *Leading Idea 3:* All output forms in the interlanguage are a consequence of Grammar_{L1}.
- *Leading Idea 4:* A transitive relationship exists between H₀ and Grammar_{L2}.
- *Leading Idea 5:* No direct access to H₀ occurs in the acquisition of a second language.
- *Leading Idea 6:* There is no fundamental difference between L1 and L2 acquisition.

The structure of the chapter is as follows: section §8.2 provides evidence for leading idea 1, §8.3 provides evidence for leading ideas 2, 3, and 4, §8.4 offers evidence for leading idea 5, §8.5 provides evidence for leading idea 6, and finally, §8.6 offers a number of closing comments.

8. 2 Two concurrent grammars - *Leading Idea 1*

The fundamental proposal of this thesis is that two grammars, or concurrent rankings, exist in the mind of the bilingual (see ch.1§1.2). The alternative is simply untenable: making the false assumption that cognitive capability only allows a single grammar to exist. If the ranking of Vietnamese undergoes modifications and produces the English ranking, it necessarily means that the English final state no longer bears any resemblance to that of the Vietnamese input. This would require a recursive ranking when the Vietnamese native comes to speaker their L1 again, as Figure 8.1 illustrates. This cannot be the case: a Vietnamese native always has their native language available for access.

Figure 8.1: Recursive ranking: evidence for two concurrent grammars



8. 2. 1 Theoretical consequences of concurrent grammars

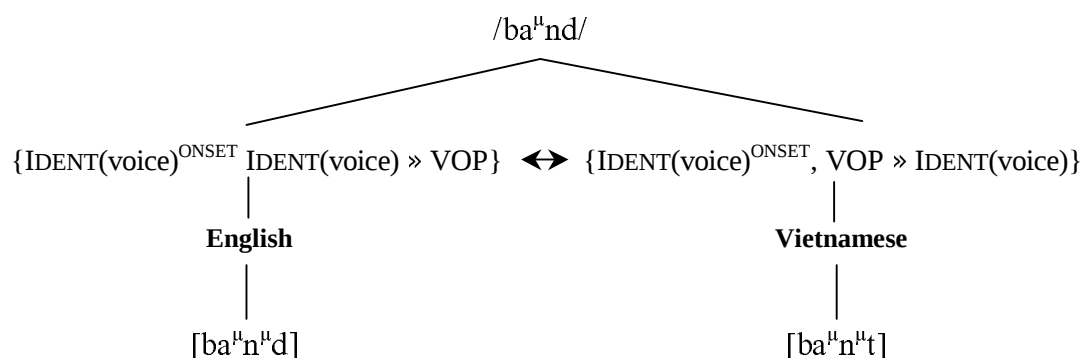
‘A crucial fact ... which any ... theory of second-language learning will have to explain is this regular reappearance or reemergence [of] ... linguistic structures which were thought to be eradicated.’
 (Selinker 1972:216)

One possible consequence of an approach that recognises two concurrent grammars in the minds of bilinguals is its ability to account for what Ellis (1985:48) describes as **backsliding**. Backsliding is the tendency for L2 speakers to produce forms that seem to have been eradicated from the output of Grammar_{L2}. Pre-OT, or rule-based, accounts of SLA regard backsliding as theoretically challenging, which is unsurprising: once a rule is in place, how can it be unlearned, and once a rule is eliminated from the native language, how could it be reintroduced?

This section argues that backsliding is purely a product of concurrent grammars. Therefore, it should be regarded, not as theoretically negative, but positive evidence for OT as a viable theory of SLA. Figure 8.2 introduces a model for backsliding. It indicates that the same input can potentially be fed through either the English or Vietnamese grammar.

This means that it can surface in two ways: /bæ^und/ → [bæ^un^u] in Vietnamese; /bæ^und/ → [bæ^un^ud] in English. This chapter does not discuss the motivation for backsliding, as it is no doubt non-phonological. In spite of this, backsliding provides potential evidence that two rankings do exist.

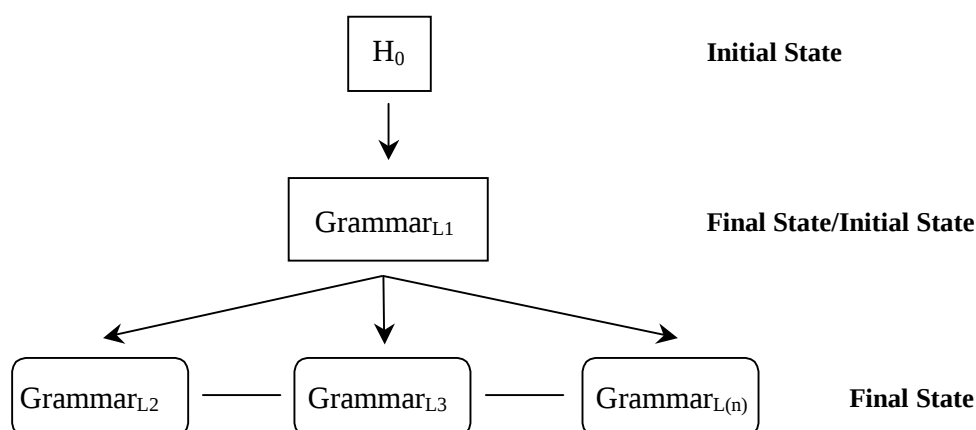
Figure 8.2: A model of backsliding



An interesting consequence of Grammar_{L1} acting as the input to Grammar_{L2} is the consideration as to which ranking acts as the input to a third language. If the native language fulfils this role, then it is

clear that the ranking of Grammar_{L1} is itself acting as the new H₀, as Figure 8.3 illustrates. This consideration must remain speculative, but it would certainly be interesting to see which forms appear in the interlanguage of a German/French bilingual who begins to learn English, for example.

Figure 8.3: Ranking_{L1} as a potentially the new H₀ - (adapted from Epstein et al. 1996:680)



8.3 Language transfer and TETU – *Leadings ideas 2, 3, and 4*

‘An OT perspective on second-language acquisition may offer a partial resolution to the vexed question of transfer versus universals’.
(McCarthy 2002:213)

Ch.4§4.4 illustrated that most, if not all, outputs in the interlanguage are the product of the Vietnamese ranking selecting an optimal candidate from an L2 input. Ch.3 presented the motivation for this claim: it provided a contrastive analysis of the phonology of Vietnamese and English coda structure, illustrating that for a Vietnamese speaker to learn English, the rerankings in Table 8.1 must take place.

Table 8.1: Constraint ranking: moving from Vietnamese to English – (repeated from ch.3§3.3)

Rankings - H ₀	Vietnamese	English	Comment
*TRIMOR ₁ , WBP ₂ » MAX ₁	M ₁ , M ₂ » F ₁	M ₁ , F ₁ » M ₂	± Coda Complexity
VOP » IDENT(voice) ₁ , IDENT(voice) ₂ ^{ONSET}	F ₂ » M » F ₁	F ₁ , F ₂ » M	± Obstruent Voicing
*CONT » IDENT(cont) ₁ , IDENT(cont) ₂ ^{ONSET}	F ₂ » M » F ₁	F ₁ , F ₂ » M	± Continuant Surfacing

The main consequences of the Vietnamese ranking acting as the input to the interlanguage were the effects of TETU. TETU illustrated that there is no conflict between whether language transfer or direct access to innate linguistic universals were the primary influences in SLA (McCarthy 2002:213). In other words, TETU reflects *both* H₀ and the input Vietnamese ranking.

Evidence for this conclusion comes from cases such as the interaction of the markedness constraint VOP with the faithfulness constraint IDENT(voice): Vietnamese provides no evidence for voiced final obstruents in the ambient language; this means that there is never any reason to demote VOP below

IDENT(voice), [[**(M)** VOP » **(F)** IDENT(voice)]]]. This results in the Vietnamese speaker only being able to militate against hypothetical inputs with final voiced obstruents, according to the rich base (see ch.3§3.2.3.1). English does provide positive evidence for the demotion of VOP below IDENT(voice): voiced obstruents do occur word finally in the ambient language, [[**(M)** VOP » **(F)** IDENT(voice)]] → [[**(F)** IDENT(voice) » **(M)** VOP]].

This disparity of ranking means that when the Vietnamese speaker comes to learn English, VOP ‘emerges’ and voiced stops surface as devoiced (see ch.4§4.4.2): /la^und/ → [la^un^ht]. The natural conclusion that can be drawn from this is that as long as one knows the rankings of both the native and target language, all outputs in the relevant interlanguage should be predictable.

This means that the outputs that a speaker of French will produce when they begin to learn Russian should be expected. The only difficult case in the thesis was the activity of MORPH-REAL (see ch.4§4.4.1.1), in which MORPH-REAL was an unexpected case of TETU. However, it still illustrated transfer, albeit tacitly²⁵.

Ch.2§2.3.1 also introduced three key ideas in the context of analogising L1 acquisition and SLA, the third of which claims that H₀ is in a transitive relationship with the final state. TETU in the interlanguage clearly shares this feature with L1 acquisition: because the final state of Grammar_{L1} actually forms the input to Grammar_{L2}, it comes as no surprise that transitivity should survive.

8. 4 No access to H₀ - *Leading Idea 5*

This thesis also investigated the possibility that direct access to H₀ is the primary motivation in SLA (see ch.1§1.2). Ch.6 tested this hypothesis empirically: as Vietnamese and English both allow codas, it must be the case that MAX and DEP dominate NO-CODA in each language. The language transfer hypothesis predicted that underlying forms such as /pe^un/ could surface without a coda, *[pe^u].

If this mapping does occur, then evidence exists for *direct* access to H₀. The data conclusively proved that access does not occur (see ch.6§6.4). Ch.6§6.4.2 also illustrated that cases that look like access to H₀ are merely further cases of language transfer: /ka^ur^und/ → /ka^ur^u/ ‘kind’ owing to the restriction on consonants following the diphthong [aɪ] in Vietnamese.

²⁵ An interesting consequence of this is that it should also be easier for a language learner to acquire the ‘phonologies’ of languages that share some of the same rankings as the native L1.

8. 5 Homogenous L1 and L2 acquisition – *Leading Idea 6*

‘Learning a second language ... constitutes a very different task from learning the first language’
(Lado 1957)

The thesis has illustrated that Lado’s (1957) rule-based account of SLA is mistaken: the mechanics of L1 and L2 acquisition are the same. As section §8.3 discussed, Ch.2§2.3.1 posited three key ideas that analogised L1 and L2 acquisition. The remaining two are now discussed.

Key Idea 1 – This key idea proposed that an input ranking forms the initial state of the grammar. This initial state, under pressure from positive evidence, motivates constraint reranking (see ch.2§2.3.1 and ch.7§7.3.2). Both L1 and L2 acquisition have an initial ranking. The difference rests in the fact as to what forms the initial state in both types of acquisition. In L1 acquisition, H_0 is a set of constraints that only reflect $[[M \gg F]]$, but in SLA, the initial state is the final state of L1 (see ch.3§3.3).

Key Idea 2 – This key idea predicted that output variability is a consequence of reranking. The interlanguage justifies the prediction. In fact, its very name reflects the fact that it is an unstable linguistic system, as ch.4§4.4.4 illustrated, and for which ch.5 provided a formal base for ranking variation. For example, an underlying form such as $/gə^u \upsilon^u ld/$ ‘gold’ surfaced as $[gə^u w l^u t]$.

This form is important because it both reflects the English ranking $[[MAX \gg WBP]]$ and the Vietnamese ranking $[[VOP \gg IDENT(voice)]]$. Importantly, ch.5§5.3 also illustrated that even the same speakers vary in their outputs from the same input: from $/ka^u r^u nd/$ ‘kind’, consultant D consistently produced two outputs that reflect a process of reranking: $[ka^u r^u]$ and $[ka^u r^u nd]$.

8. 6 Closing comments

This thesis has provided an account as to how OT can explain both the process and surface facts of second language acquisition. While the overall proposals of the thesis stand, there were data that remained elusive: ‘month’ displayed a case of epenthesis (see ch.3§3.2.1), ‘sound’ displayed a case of nasal deletion, which the analysis could not account for (see ch.4§4.4.2), and ‘ground’ exhibited a simplification that exceeded the prediction of language transfer (see ch.6§6.5).

Future study is clearly needed to address these issues. In addition, all the ideas proposed in this thesis would certainly benefit from both a longitudinal study of a single speaker and a more refined analysis. For example, the analysis of the moraic structure of vowels and diphthongs certainly works, but it could well turn out to be too powerful in its predictions; therefore, more data is necessary to support the current analysis. Despite these potential setbacks, the aim of the thesis has been met: initial and suggestive evidence has been provided that ranking transference and subsequent reranking form the only mechanism in which a second language is acquired within the framework of Optimality Theory.

Appendix: Vietnamese ranking transfer in the interlanguage

The following tables provided evidence for the analysis presented in ch.4. Table (1), a more detailed way of presenting Figure 4.1 (see ch.4§4.4), presents a summary of all transfer data. The appendix is split into three sections: the first introduces deletion (see ch.4§4.4.1), the second introduces devoicing of final voiced obstruents (see ch.4§4.4.2), and the third gives all those tokens there were produced faithfully. The data dealing with continuant deletion are all found in ch.4§4.4.3, and those that address the anomalous cases are found in ch.3§3.2.1, ch.4§4.4.2, and ch.6§6.5.

Table 1: Summarising the transfer data

Mappings	Faithful		Deletion		Devoicing		*CONT		?	
Input (<i>n</i> = 120)	43	36%	50	41%	16	14%	8	7%	3	2%

- *Deletion in the interlanguage*

Consultant: T

Table 2: Monomorphemic Inputs

Gloss	Input	Output	Deletion	Occurrences
a. old	/əʊld/ - VVC ₁ C ₂	[əwl] - VVC ₁	/d/ → [Ø]	2

Table 3: Bimorphemic Inputs

Gloss	Input	Output	Deletion	Occurrences
a. cards	/kɒd-z/ - CVVC ₁ + C	[kɒz] - CVV + C	/d/ → [Ø]	1
b. looks	/lʌk-s/ - CVC ₁ + C	[lʌs] - CV + C	/k/ → [Ø]	1
c. friends	/frɛnd-z/ - CCVNC ₁ + C	[frɛnz] - CCVN + C	/d/ → [Ø]	1
d. hands	/hænd-z/ - CVNC ₁ + C	[hænz] - CVN + C	/d/ → [Ø]	1

Consultant: B

Table 4: Monomorphemic Inputs

Gloss	Input	Output	Deletion	Occurrences
a. cold	/kəʊld/ - CVVC ₁ C ₂	[kəwl] - CVVC ₁	/d/ → [Ø]	1
b. old	/əʊld/ - VVC ₁ C ₂	[əwl] VVC ₁	/d/ → [Ø]	7
c. band	/bænd/ - CVNC ₁	[bæn] - CVN	/d/ → [Ø]	1
d. hand	/hænd/ - CVNC ₁	[hɛn] - CVN	/d/ → [Ø]	1
e. kind	/kamd/ - CVVNC ₁	[kaɪ] - CVV	/n/ → [Ø] /d/ → [Ø]	1

Table 5: Bimorphemic Inputs

Gloss	Input	Output	Deletion	Occurrences
a. holds	/həʊld-z/ - CVVC ₁ C ₂ + C	[həʊlɪz] - CVVC ₁ + C	/d/ → [Ø]	1

Consultant: HTable 6: Monomorphemic Inputs

Gloss	Input	Output	Deletion	Occurrences
a. old	/əʊld/- VVC ₁ C ₂	[əʊlɪ]- VVC ₂	/d/ → [Ø]	3
b. band	/bənd/- CVNC ₁	[bænɪ]- CVN	/d/ → [Ø]	3
c. child	/tʃaɪld/- CVVC ₁ C ₂	[tʃaɪɪ]- CVV	/l/ → [Ø] /d/ → [Ø]	1

Table 7: Bimorphemic Inputs

Gloss	Input	Output	Deletion	Occurrences
a. cards	/kɔd-z/ - CVVC ₁ + C	[kɔzɪ] - CVV + C	/d/ → [Ø]	2
b. words	/wɜd-z/ - CVVC ₁ + C	[wɜzɪ] - CVV + C	/d/ → [Ø]	1
c. parts	/pɑt-s/ - CVVC ₁ + C	[pɑsɪ] - CVV + C	/t/ → [Ø]	1
d. birds	/bɜd-z/ - CVVC ₁ + C	[bɜzɪ] - CVV + C	/d/ → [Ø]	1
e. dogs	/dɒg-z/ - CVC ₁ + C	[dɒzɪ] - CV + C	/g/ → [Ø]	1
f. friends	/friɛnd-z/ - CCVNC ₂ + C	[friɛnzɪ] - CCVN + C	/d/ → [Ø]	1
g. brains	/brɛɪn-z/ - CCVVN + C	[brɛɪzɪ] - CCVV + C	/n/ → [Ø]	1
h. pounds	/paʊndz/ - CVVNC ₂ + C	[paʊzɪ] - CVV + C	/d/ → [Ø] /n/ → [Ø]	4

Consultant: DTable 8: Monomorphemic Inputs

Gloss	Input	Output	Deletion	Occurrences
a. old	/əʊld/ - VVC ₁ C ₂	[əʊlɪ] - VVC ₁	/d/ → [Ø]	1
b. kind	/kaɪnd/ - CVVNC ₁	[kaɪɪ] - CVV	/n/ → [Ø] /d/ → [Ø]	4
c. child	/tʃaɪld/ - CVVC ₁ C ₂	[tʃaɪɪ] - CVV	/l/ → [Ø] /d/ → [Ø]	3

Table 9: Bimorphemic Inputs

Gloss	Input	Output	Deletion	Occurrences
a. cards	/kɑd-z/ - CVVC ₁ + C	[kas] - CVV + C	/d/ → [Ø]	1
b. types	/taɪp-s/ - CVVC ₁ + C	[taɪs] - CVV + C	/p/ → [Ø]	1
c. birds	/bɜd-z/ - CVVC ₁ + C	[bɜz] - CVV + C	/d/ → [Ø]	1
d. kinds	/kaɪnd-z/ - CVVNC ₁ + C	[kaɪs] - CVV + C	/n/ → [Ø] /d/ → [Ø]	2

- *Devoicing in the interlanguage*

Consultant: T

Table 10: Bimorphemic Inputs

Gloss	Input	Output	Devoicing	Occurrences
a. pigs	/pɪg-z/ - CVC ₁ + C	[pɪks] - CVC ₁ + C	/g/ → [k] /z/ → [s]	1
b. dogs	/dɒg-z/ - CVC ₁ + C	[dɒks] - CVC ₁ + C	/d/ → [t] /z/ → [s]	2

Consultant: H

Table 11: Monomorphemic Inputs

Gloss	Input	Output	Devoicing	Occurrences
a. gold	/gəʊld/ - CVVC ₁ C ₂	[gəʊlt] - CVVC ₁ C ₂	/d/ → [t]	1

Table 12: Bimorphemic Inputs

Gloss	Input	Output	Devoicing	Occurrences
a. legs	/lɛg-z/ - CVC ₁ + C	[lɛks] - CVC ₁ + C	/g/ → [k] /z/ → [s]	2
b. pigs	/pɪg-z/ - CVC ₁ + C	[pɪks] - CVC ₁ + C	/g/ → [k] /z/ → [s]	2
c. dogs	/dɒg-z/ - CVC ₁ + C	[dɒks] - CVC ₁ + C	/g/ → [k] /z/ → [s]	1

Consultant: DTable 13: Bimorphemic Inputs

Gloss	Input	Output	Deletion	Occurrences
a. pubs	/pʌb-z/ - CVC ₁ + C	[pʌps] - CVC ₁ + C	/b/ → [p] /z/ → [s]	1

Table 14: Monomorphemic Inputs

Gloss	Input	Output	Devoicing	Occurrences
a. kind	/kaɪnd/ - CVVNC ₁	[kaɪnt] - CVVNC ₁	/d/ → [t]	1
b. gold	/gəʊld/ - CVVC ₁ C ₂	[gəʊlt] - CVVC ₁ C ₂	/d/ → [t]	1
c. stand	/stænd/ - CCVNC ₁	[stænt] - CCVNC ₁	/d/ → [t]	1
d. land	/lænd/ - CVNC ₁	[lænt] - CVNC ₁	/d/ → [t]	1
e. old	/əʊld/ - VVC ₁ C ₂	[əʊlt] - VVC ₁ C ₂	/d/ → [t]	2

- *Faithfulness in the interlanguage*

Consultant: TTable 15: Monomorphemic Inputs

Gloss	Input	Output	Occurrences
a. wolf	/wʊlf/ - CVC ₁ C ₂	[wʊlf] - CVC ₁ C ₂	1
b. band	/band/ - CVC ₁ C ₂	[band] - CVC ₁ C ₂	3
c. cold	/kəʊld/ - CVVC ₁ C ₂	[kəʊld] - CVVC ₁ C ₂	1
d. film	/fɪlm/ - CVC ₁ C ₂	[fɪlm] - CVC ₁ C ₂	3
e. old	/əʊld/ - VVC ₁	[əʊd] - VVC ₁ C ₂	1
f. child	/tʃaɪld/ - CVVC ₁ C ₂	[tʃaɪld] - CVVC ₁ C ₂	1
g. band	/band/ - CVC ₁ C ₂	[band] - CVC ₁ C ₂	3
h. hand	/hand/ - CVC ₁ C ₂	[hand] - CVC ₁ C ₂	1
i. shine	/ʃaɪn/ - CVVC ₁	[ʃaɪn] - CVVC ₁	3
j. nine	/naɪn/ - CVVC ₁	[naɪn] - CVVC ₁	2

Table 16: Bimorphemic Inputs

Gloss	Input	Output	Occurrences
a. birds	/bɜːd-z/ - CVC ₁ + C	[bɜːdz] - CVC ₁ + C	1
b. dogs	/dɒg-s/ - CVC ₁ + C	[dɒgz] - CVC ₁ + C	1
c. drips	/dɹɪp-s/ - CCVC ₁ + C	[dɹɪps] - CCVC ₁ + C	1

Consultant: DTable 17: Monomorphemic Inputs

Gloss	Input	Output	Occurrences
a. kind	/kaɪnd/ - CVVC ₁ C ₂	[kaɪnd] - CVVC ₁ C ₂	1
b. film	/fɪlm/ - CVC ₁ C ₂	[fɪlm] - CVC ₁ C ₂	1
c. nine	/naɪn/ - CVVC ₁	[naɪn] - CVVC ₁	3

Table 18: Bimorphemic Inputs

Gloss	Input	Output	Occurrences
a. books	/bʊk-s/ - CVC ₁ + C	[bʊks] - CVC ₁ + C	1
b. sticks	/stɪk-s/ - CCVC ₁ + C	[stɪks] - CCVC ₁ + C	1
c. drips	/dɹɪp-s/ - CCVC ₁ + C	[dɹɪps] - CCVC ₁ + C	1

Consultant: HTable 19: Monomorphemic Inputs

Gloss	Input	Output	Occurrences
a. branch	/brʌntʃ/ - CCVC ₁ C ₂	[brʌntʃ] - CVC ₁ C ₂	1
b. month	/mʌnθ/ - CVC ₁ C ₂	[mʌnθ] - CVC ₁ C ₂	1
c. hand	/hænd/ - CVC ₁ C ₂	[hænd] - CVC ₁ C ₂	1

Table 20: Bimorphemic Inputs

Gloss	Input	Output	Occurrences
a. groups	/ɡɹʊp-s/ - CCVC ₁ + C	[ɡɹʊps] - CCVC ₁ + C	1
b. queens	/kwɪn-z/ - CCVC ₁ + C	[kwɪnz] - CCVC ₁ + C	1
c. guns	/ɡʌn-z/ - CVC ₁ + C	[ɡʌnz] - CVC ₁ + C	3
d. wings	/wɪŋ-z/ - CVC ₁ + C	[wɪŋz] - CVC ₁ + C	1
e. wheels	/wɪl-z/ - CVC ₁ + C	[wɪlz] - CVC ₁ + C	1
f. combs	/kəʊm-z/ - CVVC ₁ + C	[kəʊmz] - CVC ₁ + C	1
g. drips	/dɹɪp-s/ - CVC ₁ + C	[dɹɪps] - CCVC ₁ + C	1

Consultant: BTable 21: Monomorphemic Inputs

Gloss	Input	Output	Occurrences
a. drips	/dɹɪp-s/ - CCVC ₁ + C	[dɹɪps] - CCVC ₁ + C	1

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