

Discontinuous noun phrases in Vietnamese

Inauguraldissertation zur Erlangung des Grades eines Doktors der Philosophie

im Fachbereich Neuere Philologien

der Johann Wolfgang Goethe-Universität zu Frankfurt am Main

vorgelegt von

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Berlin

Einreichungsjahr: 2018

Erscheinungsjahr: 2022

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Tag der mündlichen Prüfung: 3.5.2019

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Preface

My interest in language led me to start studying linguistics in 2009. I wanted to learn more about language and to understand how language functions. However, after all this time studying do I really know what language actually is and how it can be analysed? Certainly, I know much more about language than the average person, but the more I learn, the more questions I ask and the more I question things that had been clear before. All this leads me to marvel at the beauty of language and to recognize that it will never be fully understood by human kind. Nevertheless, contributions, however small they are, can be made to understand language better.

One of these contributions is this thesis on “Discontinuous noun phrases in Vietnamese”. It was written within the Research Training Group “Nominal Modification” at Goethe University of Frankfurt. Discontinuous noun phrases were one of the proposed thesis subjects that looked interesting to me. Since Vietnamese is my husband’s heritage language I had already been interested in this language before and had learned to speak it. Therefore, I decided to take “Discontinuous noun phrases in Vietnamese” as the topic of my thesis.

I want to thank everyone who helped me with this thesis. First of all, I want to thank my first supervisor, Caroline Féry, for all the effort she has made in supervising me. She did much more than she was required to and was always kind and encouraging. She also organized the proof-reading of this work by Kirsten Brock to whom I am very grateful for all of her good work.

I also want to thank my second supervisor Gisbert Fanselow. Despite his working at a different university, we could set up meetings to discuss the content of my thesis.

I am grateful for the structure provided by the Research Training Group which allowed me to do research and to get regular feedback on it. Therefore, I would like to thank everyone involved in it: the principle investigators Markus Bader, Jost Gippert, Katharina Hartmann, Cécile Meier, Cecilia Poletto, Esther Rinke, Manfred Sailer, Petra Schulz, Gert Webelhuth, Helmut Weiß and Ede Zimmermann; the postdocs and associated postdocs Sascha Alexeyenko, Ingo Feldhausen, Gerrit Kentner, Beata Moskal and Peter Smith; the PhD students and associated PhD students Julia Biskupek, Seyna Maria Dirani, Eugenia Fahrnbach, Samuel Issah, Mariam Kamarauli, Maria Kofler, David Lahm, Nicolas Lamoure, Carolin Reinert, Anja Šarić, Yranahan Traoré, Sabrina Weber and Merle Weicker.

This thesis contains many data from Vietnamese, therefore I am so grateful to the Vietnamese linguists that have helped me collect this data and have evaluated sentences for me: Quỳ Ngọc

Đoàn, Dũng Hoàng, Khắc Cường Lê, Mai Hoàng and her husband, Quốc Dũng Nguyễn, Loan Nguyễn, Thuận Trần and Thủy Vịnh Trần.

Due to the generous support from the German Research Foundation, I was able to travel to Vietnam to conduct an experiment with speakers of the Southern dialect. I am very thankful to everybody who helped me during this stay to establish contact with the local people and to organize the logistics of this experiment. During my research stay in Ho-Chi-Minh City I was told that families living in Ho-Chi-Minh City for three generations are rare, however I got to know several people who had moved to Ho-Chi-Minh City with their families from the surrounding areas and who participated in my experiment.

A big thanks to everyone who participated in my experiments, both in Germany and in Vietnam. Without these participants this research would not have been possible.

I would like to thank my family and my husband's family for all the support they have given me in completing this thesis in so many ways: in helping me with citations, in speaking Vietnamese to me, in answering questions about statistics and formatting issues, in introducing me to many parts of the Vietnamese culture and in encouraging me in so many personal ways.

Finally, I am so grateful for all the love and support of my husband Kiên Alex Duong Phu during the time of writing this thesis and throughout all of my studies. Without him I would never have written a thesis on Vietnamese, therefore this book is dedicated to him.

Abstract

Since Vietnamese is an isolating language, word order plays an important role in identifying the function of a particular word. Yet in some contexts, word order may be flexible especially in the case of special information-structural settings. Discontinuous noun phrases constitute a specific case of non-canonical word order in Vietnamese. In (1), the head noun *cam* ‘orange’ is separated from the numeral-classifier complex: the fronted noun takes the role of a contrastive topic and the numeral-classifier complex is the focus:

- (1) Cam tôi mua hai trái.
orange I buy two CLF
‘I buy two oranges.’

This word order is contrasted with the canonical word order in (2), where the noun *cam* ‘orange’ appears after the classifier. (2) does not require a special information-structural setting, but is uttered in a context of all-sentence focus.

- (2) Tôi mua hai trái cam.
I buy two CLF orange
‘I buy two oranges.’

I have conducted two read-speech experiments in order to find out whether there are prosodic or intonational effects in a comparison between continuous and discontinuous noun phrases in Vietnamese. In the first experiment, speakers from the Northern dialect were recorded and in the second experiment speakers from the Southern dialect. The results showed prosodic differences in the two word order conditions in both dialects. The duration of the classifier is significantly longer ($p < 0.001$, ANOVA calculation) in the case of discontinuous noun phrases and the rising tone (*sắc*) is clearly articulated as rising. In the case of continuous noun phrases, the duration of the classifier is significantly shorter ($p < 0.001$, ANOVA calculation) and a classifier with rising tone may lose its rising property. These prosodic effects are related to prosodic boundaries. In the case of discontinuous noun phrases, the classifier constitutes the prosodic boundary, whereas with continuous noun phrases, the (right) prosodic boundary occurs further to the right.

I assume that in Vietnamese there is generally a correspondence between syntactic and prosodic structure as in Selkirk (2011) and Féry (2017).

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This means that for example the DP *hai trái cam* ‘two oranges’ (two CLF orange) is matched by a prosodic phrase, thus (hai trái cam)_φ. However, when the noun *cam* ‘orange’ is separated from the numeral-classifier complex, the noun and the classifier form a prosodic phrase on their own: (hai trái)_φ. It can thus be concluded that intonation effects in Vietnamese are not only present when expressing sentence modality and when changing the role of function words (Đỗ et al. 1998 and Hà & Grice 2010), but they also play a role in word order change, as in discontinuous nominal phrases.

When it comes to syntactic aspects of discontinuous noun phrases, I discuss whether split constructions in Vietnamese involve movement as proposed by Trịnh (2011) or base-generation as put forward by Fanselow & Féry (2006). I argue for base-generation analysis since the second part of a discontinuous NP (remnant) may also occur outside of discontinuous noun phrases without its head noun and some discontinuous noun phrases do not have a continuous counterpart.

My study confirms the connection between syntax and prosody. The two parts of the discontinuous noun phrase form their own phrases syntactically as well as prosodically.

Chapter 1 Introduction

1.1 Motivation for interdisciplinary research on discontinuous noun phrases in Vietnamese

In this book, discontinuous noun phrases in Vietnamese are studied from different perspectives, i.e. information structure, syntax-phonology interface, morpho-syntax, as well as the role of classifiers. This interdisciplinary approach allows a better understanding of the factors influencing discontinuous noun phrases in Vietnamese. From this interdisciplinary research on NP split constructions in Vietnamese, conclusions can be drawn on discontinuous NPs in Vietnamese and their properties. Since discontinuous noun phrases force marked pitch and phrasing, it is interesting to see how they are realized in a language with lexical tones like Vietnamese. In earlier typological research (Fanselow & Féry 2006, p. 75), it was assumed that intonation languages are more likely to have discontinuous noun phrases compared to other language types. Initially it had been taken for granted that tone languages do not display any kind of intonational effects (cf. Yip 2002). However, recent research has shown that there are indeed intonation effects in tone languages (for Vietnamese, see Han & Kim 1974, Đỗ et al. 1998, Brunelle 2009, Hà 2012, Hà & Grice 2010, Brunelle, Hà & Grice 2016). To my knowledge, none of the earlier research on Vietnamese analysed whether there are intonation effects with regard to word order change, which makes my research on discontinuous noun phrases a crucial contribution to the field.

Asian contour tone languages usually do not display a great amount of morphology and are therefore considered to be isolating languages. For these kinds of languages it may be assumed that they do not contain discontinuous noun phrases in the sense that there is a single underlying noun phrase, but rather they consist of free topics and foci which are strictly separated from each other. However, according to Fanselow & Féry (2006) “There is no *a priori* reason for drawing the division line between noun phrase discontinuity and free topics at a specific point in this continuum rather than at another” (p. 10). In this sense, I assume that Vietnamese has discontinuous noun phrases, yet I will discuss their status as “free topics” as well.

In this chapter, both the Vietnamese language (Section 1.2 – 1.7), as well as discontinuous noun phrases are introduced (Section 1.8 – 1.12).

1.2 Classification of Vietnamese in the languages of the world

Vietnamese is an Austro-Asiatic language, more precisely a Mon-Khmer language with 68 million speakers (Simons & Fenning 2017). It is a tone language with 6 lexical tones in the Northern dialect and 5 tones in the Southern dialect (for a description of Vietnamese tones see Section 4.1). The following definition of tone language is used: “A tone language is one in which an indication of pitch enters into the lexical realization of at least some morphemes.” (Yip 2002, p. 4). In Vietnamese, all morphemes contain at least one tone. As for Vietnamese grammar, Vietnamese is a strongly isolating language with SVO word order.

1.3 Vietnamese – A pro-drop language

Vietnamese is a pro-drop language that means that a verb phrase may occur without a subject. The following dialogue may be uttered in a casual conversation:

- (1) A: *Khỏe không?*
be healthy not
‘How are you?’
- B: *Đạ khỏe.*
yes (to an older person) (be) healthy
‘I’m fine.’

In (1) the stative verb *khỏe* ‘be healthy’ functions as 2nd person when uttered by speaker A. The same verb functions as a 1st person verb when used by speaker B. Since Vietnamese does not show any verbal inflection, only the context disambiguates the subject. The ellipsis of the person as in (1) may also be analysed as a strategy of marking givenness.

1.4 Words taken from family relations as pronouns

Words which are taken from family relationships, are frequently used instead of pronouns in Vietnamese, such as *chị* ‘older sister’ in (2). The question and answer in (2) would be felicitous in the following context: A is a friend of B, and A is a few years younger than B, but still of the same generation.¹

¹ Note that this is only one possible context. The usage of family relation nouns in Vietnamese is rather complex and may depend on many different factors among them age, social status and level of politeness. The term *chị* ‘older sister’, for example, may also be used to politely address someone who is younger than the speaker.

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- (2) A: Chị đang làm cái gì?
older sister PROG make thing what²
'What are you doing?'
- B: Chị đang đọc sách.
older sister PROG read book
'I'm reading a book.'

Family relation nouns are also used to talk about another person as in (3). (For more information about this usage see Section 2.4.1.2)

- (3) Chị Hoa đang đọc sách.
older sister Hoa PROG read book
'Hoa is reading a book.'

1.5 The Vietnamese noun phrase

Vietnamese is a numeral-classifier language. Thus, the occurrence of a classifier makes the noun countable (for more information on classifiers see Chapter 2 "Classifiers").

A Vietnamese noun is transnumeral and is therefore compatible with both singular and plural meaning (cf. J. Trần 2011, p. 15). In (4) *heo* means both 'pig' and 'pigs' and can furthermore be definite and indefinite.

- (4) heo
'the/a pig/s'

However, to express 'pigs' as in 'two pigs' it is not possible to simply put the number for 'two' before the noun, as can be seen in (5).

- (5) *hai heo
two pig
'two pigs'

The classifier *con* needs to occur between the numeral and the noun as in (6) to make the noun phrase grammatical:

² In this book, glosses are used in accordance with the Leipzig glossing rules (Department of Linguistics of the Max Planck Institute for Evolutionary Anthropology & Department of Linguistics of the University of Leipzig 2015). Examples from other authors are changed to this convention and, if necessary translated into English.

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- (6) hai con heo
two CLF pig
'two pigs'

Nevertheless, there are some nouns in Vietnamese that are countable without the occurrence of a classifier. The word *sinh viên* 'student', for example, belongs to this class (cf. J. Trần 2011, p. 17). Thus, (7) is grammatical without a classifier:

- (7) hai sinh viên
two student
'two students' (see Section 2.4.5 for more information on count nouns in Vietnamese)

In certain emphatic contexts, the *extra cái* (usually a classifier for inanimate objects) may occur in addition to other classifiers. It also functions as a focus marker (see Section 1.7.2). The *extra cái* is a particle that has the same phonological representations as *cái*, the classifier for things. Yet it occurs before a classifier³, but following a numeral, as can be seen in (8):

- (8) NUM – CÁI – CLF – N – ADJ – DEM (modified from T. H. Nguyễn 2004, p. 44)

(9) and (10) show examples of the usage of *extra cái*.

- (9) Cái con chó này dữ.
PART⁴ CLF dog this bad
'This dog is really bad.'

- (10) Cái cô gái này thật đẹp.
PART young girl this really beautiful
'This girl is really beautiful.'

It is not clear whether Vietnamese has lexical articles. Most authors argue that Vietnamese does not have lexical articles (cf. Thompson 1965, Emeneau 1951, D.-H. Nguyễn 1997). Yet T. H. Nguyễn (2004) analyses Vietnamese as a language with lexical articles.

In earlier studies, I constructed a questionnaire to investigate whether certain constructions with the numeral "one" and other constructions such as a classifier-noun-phrase had a clear tendency to be interpreted as indefinite or definite. The results showed that there is no such tendency. Therefore, I do not assume that Vietnamese has definite and/or indefinite articles.

³ Except before the classifier *cái* (cf. T. H. Nguyễn 2004, p. 43-44).

⁴ This gloss is used to refer to particles.

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Numerals, classifiers, as well as the *extra cái* function as pre-modifiers whereas other NPs, adjective phrase, prepositional phrases, relative clauses, demonstratives, or possessive phrases may occur as postmodifiers. The order of the individual constituents of a noun phrase is fixed as in (11) (repetition of (8)). (12) is an example of a Vietnamese noun phrase.

(11) NUM – CÁI – CLF – N – ADJ – DEM (modified from T. H. Nguyễn 2004, p. 44)

(12) bốn trái táo đỏ này
four CLF (fruit) apple red this
'these four red apples'

Note that adjectives in Vietnamese are actually stative verbs which means that an 'adjective' has the inherent meaning of 'being ...' (cf. Löbel 1996). In (13) *buồn* '(be) sad' is directly connected to the proper name 'Hoa' without an auxiliary. For reasons of simplification, I will still use the term 'adjective' to refer to Vietnamese stative verbs.

(13) Hoa buồn.
Hoa (be) sad
'Hoa is sad.'

When other NPs function as post-modifiers they restrict the preceding NP, as may be seen in the following example:

(14) sách y học
book medicine (discipline)
'medicine book'

However, some Vietnamese words are of Chinese origin; for these words a modifier may occur before the noun as in (15) (cf. T. H. Nguyễn 2004).

(15) văn phòng
literature room
'bureau'

1.6 Vietnamese quantifiers

Vietnamese quantifiers generally do not occur on their own without a classifier or noun following them. In (16) we see the colour *đỏ* 'red' occurring with the classifier *cái*. In this case it is also possible to additionally put the noun *màu* 'colour' directly before *đỏ* 'red', however this is not obligatory. The adjective *đẹp* 'beautiful' in (17) is connected with the noun *áo* 'top'.

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As can be seen from (18) and (19), it is not possible for *đỏ* ‘red’ and *đẹp* ‘beautiful’ to occur on their own without being connected to a noun or to a classifier.⁵

(16) Tôi mua cái (màu) đỏ.
I buy CLF (colour) red
‘I buy the red one.’

(17) Tôi mua áo đẹp.
I buy top beautiful
‘I buy the beautiful top.’

(18) *Tôi mua đỏ.
I buy red
‘I buy the red one.’

(19) *Tôi mua đẹp.
I buy beautiful
‘I buy the beautiful one.’

In (20) the numerals *sáu* ‘six’ and *bốn* ‘four’ occur without a noun or classifier. However, it is plausible that these are cases of ellipsis of classifiers after both numerals since we find the classifier *cái* in the first part of the enumeration.

(20) Context: Dung is a salesman. This morning he bought a lot of things.

Giương thì bán hai cái, ghế thì bán sáu và rổ thì bán
mirror TOP sell two CLF chair TOP sell six and basket TOP sell
bốn cái.
four CLF
‘He sold two mirrors, six chairs and four baskets.’

⁵ Cao (1992) gives the example in (1) where the colours *vàng* ‘yellow’ and *đỏ* ‘red’ occur on their own in topic position. This can be explained either by assuming that bare colour words can occur in topic position or by assuming that (1) is exceptional because it has a poetic style.

(1) Vàng (thì) gió, đỏ (thì) mưa.
yellow (TOP) wind red(TOP) rain
‘(A) yellow (sky announces) wind, (a) red (sky announces) rain.’ (Cao 1992)

1.7 Information structure in Vietnamese

Information structure in Vietnamese is a rather controversial topic, since we find two different points of view, which contradict each other. Jannedy (2007) proposes that focus in Vietnamese is exclusively expressed prosodically: there are no specific focus markers, and the language uses phonology to express intonational emphasis in similar ways to languages like English or German (Jannedy 2007, p. 1). T. Trần (2016) describes Vietnamese as a language with both focus and topic markers.

I am assuming that information structure in Vietnamese may be marked, both by grammatical particles and by prosody. This chapter mainly treats the non-prosodic aspects of information structure in Vietnamese. Section 4.4.4 focuses on prosodic aspects of information structure in Vietnamese.

1.7.1 Topic

Vietnamese is a topic prominent language (cf. Cao 1992, T. Trần 2016, Thompson 1965; for more information on topic prominent languages in general, see Li & Thompson 1976).

Li & Thompson (1976) define subject and topic prominent languages in the following way:

In subject-prominent (Sp) languages, the structure of sentences favo[u]rs a description in which the grammatical relation subject-predicate plays a major role; in topic prominent (Tp) languages, the basic structure of sentences favo[u]rs a description in which the grammatical relation topic-comment plays a major role (p. 459).

Thus, the topic-comment relation plays a major role in the analysis of the Vietnamese grammar.

In (21) the proper name “Nam” is subject and topic at the same time. The SVO word order in (21) is the unmarked word order.

(21) Nam mới mua một cái ghế.

Nam just buy one CLF chair

‘Nam just bought a chair.’

(T. Trần 2016, p. 53)

Vietnamese may display topicalization resulting in an OSV word order if the subject has a definite reading. Therefore, (22) is grammatical, but (23) is not (cf. T. Trần 2016, p. 53).

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(22) Cái ghế này, Nam mới mua.

CLF chair this Nam just buy

‘This chair, Nam just bought.’

(T. Trần 2016, p. 53)

(23) *Một cái ghế, Nam mới mua.

one CLF chair Nam just buy

‘Nam just bought a chair.’

(T. Trần 2016, p. 53)

Vietnamese has the topic marker *thì*, which may optionally occur after the topicalized element as in (24).

(24) Ai cũng muốn đi ăn nhưng cô Thu **thì** không

everyone want go eat but younger aunt Thu **TOP** not

muốn.

want

‘Everyone wants to eat, but Thu does not want to.’

Thus, the topic marker is not obligatory.

T. Trần (2009) suggests that Vietnamese topicalization involves long distance movement to topic position, as shown in (25), where topicalization of a doubly embedded object takes place across two clauses.

(25) Quyển sách này, [tôi đã yêu-cầu [cô Lan bảo sinh-viên

CLF book DEM I PST ask Ms Lan tell student

đọc]].

read

‘This book, I asked Ms Lan to tell students to read.’

(T. Trần 2009, p. 78)

T. Trần (2009) also shows that topicalization is island sensitive. In (26) an example of a sentence without topicalization is given. This sentence has the complex noun phrase *sinh-viên nên đọc quyển sách này*⁶ ‘students should read this book’. In (27) parts of this complex noun phrase are topicalized, namely *quyển sách này* ‘this book’. However, the topicalization degrades the acceptability of the sentence. It is now marked with “?”.

⁶ Note that in this case the complex noun phrase has a noun-complement clause structure.

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(26) Tôi đồng-ý với [ý-kiến là [sinh-viên nên đọc
 I agree with opinion COMP student should read
 quyển sách này]].
 CLF book DEM

‘I agree with the opinion that students should read this book.’ (T. Trần 2009, p. 79)

(27) ?Quyển sách này, tôi đồng-ý với [ý-kiến [là
 CLF book DEM I agree with [opinion [COMP
 sinh-viên nên đọc]].
 student should read

‘This book, I agree with the opinion that students should read.’ (T. Trần 2009, p. 79)

The sentences in (28) and (29) contain the complex noun phrase *các nguyên-tắc giải-quyết vấn-đề ấy* ‘the principles that solve that problem’. (28) contains the unmarked word order, in (29) topicalization takes place. As can be seen from the translation, the complex noun phrase contains a relative clause. Note that Vietnamese has no obligatory marker or pronoun delimiting the beginning of a relative clause. The topicalized sentence in (29) is clearly ungrammatical. This shows that the judgements for different kind of complex noun phrase islands differ (cf. sentence (27) and (29)). Still, none of the island sentences is acceptable.

(28) Tân đã bác-bỏ [các nguyên-tắc [giải-quyết vấn-đề ấy]].
 Tan PST refute PL principle solve problem DEM
 ‘Tan refuted the principles that solve that problem.’ (T. Trần 2009, p. 79)

(29) *Vấn-đề ấy, Tân đã bác-bỏ [các nguyên-tắc [giải-quyết]].
 problem DEM Tan PST refute PL principle solve
 ‘That problem, Tan refuted the principles that solve.’ (T. Trần 2009, p. 79)

T. Trần (2009) shows that topicalization is also sensitive to other islands, namely to sentential subject, coordinate structure and adjunct islands. Again, the degree of disagreement with the different island sentences differs (cf. T. Trần 2009, pp. 79-81). This topic is left for further research.

Brunelle & Michaud (2016) analyse *thì* ‘TOP’ as a contrastive topic marker. However, topicalization is not the only function of the particle *thì*. It may also function to set something in the common ground, as in (30) (see also Cao 1992, p. 141).

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- (30) Hôm qua Phương đi chợ **thì** hôm nay ở nhà.
yesterday Phương go market so today stay home
'Yesterday, Phương went to the market, so today she stays at home.'

(Brunelle & Michaud 2016, p. 785)

Another possibility to mark topic is pause insertion as in (31).

- (31) Mãng cụt _____ ai cũng thích.⁷
mangosteen TOP who also like

'Everybody likes mangosteens.'

(Brunelle & Michaud 2016, p. 784)

Less frequently, topic may be marked with the help of the "copula" *là* as shown below:

- (32) Mãng cụt là ai cũng thích.
mangosteen TOP (COP) who also like

'Everybody likes mangosteens.'

(Brunelle & Michaud 2016, p. 785)

Là is usually used as to connect two nouns or pronouns, as in (33).

- (33) Hoa là sinh viên.

Hoa be student

'Hoa is a student.'

1.7.2 Focus

Có is the verum focus marker and appears before the focused verb. This can be seen in the following example:

- (34) I wonder whether Nam goes to church or not.

Nam #(có) đi nhà thờ.

Nam PART go to church

'Nam does go to church.' (T. Trần 2016, p. 57)

Outside of the context of verum focus, *có* means 'have' or 'exist'.

T. H. Nguyễn (2004) also analysed the particle *cái* as a focus marker. *Cái* is usually a classifier for things. However, it may also be used as a focus particle with noun phrases that do not usually take the classifier *cái*. The *extra cái* always occurs before the regular classifier of a classifier-noun-complex as in the following example:

⁷ _____ indicates the pause.

(35) Tôi thích CÁI con ngựa ĐEN.⁸

I like CÁI CLF horse black

‘I like the very black horse (but not the brown one).’ (T. H. Nguyễn 2004, p. 48)

1.8 Introducing discontinuous noun phrases

Discontinuous noun phrases⁹ constitute a special kind of non-canonical word order. Therefore, they are similar to other non-canonical word orders such as extraction. Example (36) is an example of a nominal phrase (NP) in the unmarked constituent order and (37) is an example of extraction.

(36) Er hat rote Schriftrollen aus Pergament im Schrank.
he has red scrolls from parchment in the wardrobe

‘He has red scrolls out of parchment in the wardrobe.’

(37) Aus Pergament hat er rote Schriftrollen im Schrank.
from parchment has he red scrolls in the wardrobe

‘He has red scrolls out of parchment in the wardrobe.’¹⁰

As can be seen from (37), with extraction a whole constituent (in this case the prepositional phrase *aus Pergament* ‘from parchment’) occurs in a different position of the sentence (in this case the beginning of the sentence).

Whereas in non-canonical word orders like extraction (see the example from German in (37)) whole constituents are moved to another position in the derivation, in discontinuous NPs parts of the very same constituent are separated from each other. Continuous noun phrases such as *the children*, *two boys* or *some red apples* may be discontinuous in certain languages and in certain contexts. This means that the head of a noun phrase is separated from its other parts consisting of determiners, adjectives or quantifiers (cf. Fanselow and Féry 2006). In example (39) the German NP “*einige Rehe*” ‘some deer’ appears in its discontinuous form. The continuous version appears in (38) for comparison.

(38) Sie hat einige Rehe im Wald gesehen.
she has some deer in forest seen

‘She saw some deer in the forest.’

⁸ T. H. Nguyễn (2004) assumes that both the focus marker *cái* as well and the focused element are stressed. Therefore, he capitalizes these words. Generally, stressed words are capitalized in this book.

⁹ For other possible names for discontinuous noun phrases, see the end of this section.

¹⁰ The underlined parts show the parts of a noun phrase that belong together in canonical word order or indicate that the constituents share the same referent.

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- (39) Rehe hat sie einige im Wald gesehen.
deer-PL has she some in forest seen.
'She saw some deer in the forest.'

In Vietnamese, the noun phrase *hai trái cam* 'two CLF orange' (see example (40)) may be discontinuous, separating its noun from the numeral/classifier complex as in (41).

- (40) Tôi mua hai trái cam.
I buy two CLF orange
'I buy two oranges.'

- (41) Cam tôi mua hai trái.
orange I buy two CLF
'I buy two oranges.'

In this book, I will use the following definition of discontinuous NPs: "Discontinuous noun phrases occur when a noun phrase's head is separated from its other constituents or when two base-generated noun phrases share the same Θ -role" (modified definition of Fanselow & Féry 2006 and in prep.).

Note that the term *discontinuous noun phrase* is only one possible way to refer to the phenomenon described above. Féry & Fanselow (2006, p. 2) mention that the terms *split topicalization*, *partial fronting*, *incomplete category fronting* and *left branch extraction* are also used in order to describe the same phenomenon. Trutkowski (2000) adopts the DP analysis and therefore uses the term *DP-Spaltung* 'DP-split'. Trinh (2011) is aware that the term *NP split* is rather old fashioned, but still it is common enough to be used as a general term for this phenomenon:

The "NP" in NP split, then, is to be understood in the sense which dates back to the days when functional categories did not head their own projection (e.g. Chomsky 1965). The name is thus a bit anachronistic. However, it seems to have gained enough currency as the cover term of splits of nominal complexes in general to warrant being used as it is used here. (p. 75)

In this book, I will use the term "NP split constructions" as a synonym for discontinuous noun phrases. However, I am aware that the term *NP* dates back to earlier research.

1.9 Discontinuous noun phrases and information structure

Discontinuous noun phrases in Vietnamese appear in contexts with a special information-structural setting (c.f. Trịnh 2011). In (42) the first parts of the discontinuous noun phrases (*sách* ‘book’, *gạo* ‘rice’, *viết* ‘pen’) are contrastive topics, whereas their second parts (*hai quyển* ‘two CLF’, *hai kí* ‘two kilos’, *hai cây* ‘two CLF’) are foci.

(42) Context: Today Mrs Hoa buys/bought a lot of things.

Sách thì mua hai quyển, gạo thì mua hai kí, cam thì
 book TOP buy two CLF rice TOP buy two kilo orange TOP
 mua hai quả và viết thì mua hai cây.
 buy two CLF and write TOP buy two CLF

‘She buys/bought two books, two kilos of rice, two oranges and two pens.’

In German, we also find sentences with discontinuous noun phrases with similar information structure, as below:

(43) Französische Bücher hat Amina bisher nur drei LANGweilige
 French books has Amina so far only three boring
 gelesen.
 read

‘As for French books, Amina has so far only read three boring ones.’ (Ott 2012, p. 12)

In (43) *französische Bücher* ‘French books’ is the topic and *drei langweilige* ‘three boring ones’ the focus.

However, there are other occurrences of discontinuous noun phrases where we do not find such a straightforward relationship between discontinuous noun phrases and information structure, as it can be seen in the following examples:

(44) STRÄNde gibt es auch DORT schöne.
 beaches gives it also there beautiful

‘There are beautiful beaches there, too.’ (Ott 2012, p. 13)

In (44) the remainder (second part of the discontinuous noun phrase) is not in focus position.

There are also examples where the first part of a split construction is a focus as in example (45) from non-standard Viennese German. In this example *Zeitschrift* ‘magazine’ constitutes a contrastive focus although it is in a position where we would expect a contrastive topic.

(45) Context: Do you have a book on Babos?

Nein, aber Zeitschrift habe ich eine.

no but magazine have I one

‘No, but I have a magazine.’

(Puig Waldmüller 2006, p. 78)

Furthermore, there are cases where the whole sentence constitutes a focus, but which are still discontinuous as in the following example from non-standard Viennese German below:

(46) Context: What happened?

Bier ham sie welches geliefert.

beer have they some delivered

‘Beer, they delivered.’

(Puig Waldmüller 2006, p. 77)

In Vietnamese discontinuous noun phrases are only found in the context of (contrastive) topic and focus (see Section 1.11).

1.10 Nomenclature for the different parts of discontinuous noun phrases

There is no consistent nomenclature for the different parts of discontinuous noun phrases in the literature. Van Hoof (1997) speaks of *topic* and *remainder*. In example (47) *Bücher* ‘books’ constitutes the topic, whereas *zwei* ‘two’ is the remainder. She avoids the term ‘remnant’ since this term is used in another sense within the framework of ‘remnant movement’ (cf. van Hoof 1997, p. 1). However, the term *remainder* did not last. In van Hoof (2006), the term *remnant* (short form REM) is used, while still making clear that this term has nothing to do with remnant movement. Furthermore, van Hoof (2006) notes that even though she makes use of the term *topic* (short form: TOP), there are occurrences of split constructions where it is doubtful whether this constituent really constitutes a topic. Ott (2012) follows van Hoof (2006), while stating that his term does not have any theoretical implications (cf. p. 1).

(47) Bücher hat sie heute zwei gelesen.

books has she today two read

‘As for books, she read two today.’

Trutkowski (2000) uses the term remnant and NP to refer to the two parts of a discontinuous NP. At first glance, the term “NP” seems to be less problematic than “topic” since the first part of a discontinuous NP may also have a different information-structural role than topic (see example (45) and (46)). However, this again may cause difficulties since the second part of a discontinuous NP may also be analysed as an NP. In (47) *zwei* ‘two’ could also be analysed as NP ellipsis. Furthermore, there is a type of discontinuous noun phrase that involves two full

NPs, namely gapless splits (see section 1.12.3). Nevertheless, considering example (47) again, *Bücher* ‘books’ seems to be a prototypical NP, since it contains a noun, whereas *zwei* ‘two’ does not contain a noun.

To my knowledge the first position of a(n inverted) split¹¹ always contains a noun, while the second part of this type rarely contains a full noun. Therefore, I will follow Trutkowski (2000) in calling the first part of an inverted discontinuous NP *noun phrase* (NP). This leaves options about the way discontinuous noun phrases may be analysed with regard to information structure. Furthermore, I will follow van Hoof (1997) in calling the second part *remainder*, still emphasizing that this should not be confused with *remnant movement*.

1.11 Distribution of discontinuous noun phrases in Vietnamese

In this section, it will be shown that Vietnamese discontinuous noun phrases may occur with classifiers, measure terms, quantifiers, and adjectives. The discontinuous noun phrase may either be subject or object. When it comes to information structure, discontinuous noun phrases in Vietnamese occur mainly with contrastive topic and focus. However, non-contrastive topic and focus are also possible. Other information-structural settings have not been found. This is different from German, where more information-structural settings are possible (see Section 1.9).

Discontinuous noun phrases in Vietnamese also occur in a context of given topic. In this case, they are not necessary contrastive, see (48).

(48) Context (before target sentence): A: I want to know more about the story related to carambolas. What happened?

B: Khế thì cô Thu mua hai trái ở chợ.
carambola TOP younger aunt Thu buy two CLF at market
‘(Ms) Thu bought 2 carambolas at the market.’

Context (after target sentence): At this moment, she saw that the two fruits were beautiful and had a nice smell, but when she came home, it turned out that they were rotten.

The following constellation in terms of information structure is not possible in Vietnamese: the first part of the discontinuous noun phrase is a focus and the rest of the sentence is a comment as in (49).

¹¹ See Section 1.12.1.

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(49) Context: A: What did you buy?

#B: Khé thì mua hai trái.
carambola TOP buy two CLF
'I bought two carambolas.'

It is worth mentioning that examples like (49) are possible in Mandarin Chinese (cf. Féry & Wang 2012).

Furthermore, Vietnamese discontinuous noun phrases do not occur in an all-sentence-focus, as in (50).

(50) Context: A: What happened?

#B: Khé thì mua hai trái.
carambola TOP buy two CLF
'I bought two carambolas.'

In sentences like (48), the discontinuous noun phrase constitutes an object. However, a discontinuous noun phrase can be a subject as in (51) as well. In this case, the discontinuous noun phrase occurs before the verb. The noun phrase is separated from the numeral-classifier complex by the topic marker *thì*.

(51) Context: Boys and girls are singing and dancing.

Con trái thì ba người hát còn con gái thì hai người múa.¹²
boy TOP three CLF sing and girl TOP two CLF dance
'There were three boys singing and two girls dancing.'

As can be seen from (42), which is repeated in (52), discontinuous noun phrases in Vietnamese may occur either with classifiers or with measure terms like *ký* 'kilo' (for more on the distinction between classifier and measure terms, see Section 2.4.2).

¹² One informant preferred this sentence when the word *nhóm* 'group' occurred before *con* *trái* 'boy(s)' or *con* *gái* 'girl(s)' as in (1). This would turn this sentence into a gapless split (see Section 1.12.3) and alter the meaning. In this case *người* does not function as a classifier, but has the meaning 'person'.

(2) Nhóm con trái thì ba người hát còn nhóm
group boy TOP three person sing and group
con gái thì hai người múa.
girl TOP two person dance
'There were three groups of boys singing and two groups of girls dancing.'

(52) Context: Today Mrs. Hoa buys/bought a lot of things.

Sách thì mua hai quyển, gạo thì mua hai ký, cam thì mua
book TOP buy two CLF rice TOP buy two kilo orange TOP buy
hai quả và viết thì mua hai cây.
two CLF and write TOP buy two CLF

‘She buys/bought two books, two kilos of rice, two oranges and two pens.’

The quantifiers *nhiều* ‘many/a lot’ and *ít* ‘few’ may occur without a classifier as in (53).

(53) Context: Dung buys bananas and apples.

Chuối mua nhiều nhưng táo thì mua ít.
banana buy many but apple TOP buy few

‘He buys many bananas, but few apples.’

Discontinuous noun phrases also occur with colours, as shown in (54). Note that in these cases *màu* ‘colour’ has to obligatorily occur before the colour. Thus, *màu* functions as a classifier.¹³

(54) Context: Liên likes different colours for books, newspapers and magazines.

Báo thì thích màu trắng, tap chí thì thích màu đỏ
newspaper TOP like colour white magazine TOP like colour red
còn sách thì thích màu vàng.
and book TOP like colour yellow.

‘As for newspapers, she likes white ones, as for magazines, she likes red ones and as for books, she likes yellow ones.’

In (55) adjectives occur after the classifiers in the remainder of a discontinuous noun phrase.

(55) Context: Today Huong buys a lot of different kinds of roots.

Gừng thì mua củ to, củ nhỏ, còn táo thì trái ngon, trái
ginger TOP buy CLF big CLF small and apple TOP CLF delicious CLF
dở.

bad

‘She buys big and small ginger, as well as delicious and bad apples.’

¹³ It is worth mentioning that Fanselow & Féry (2006) give an example where the colour *đỏ* ‘red’ in (3) occurs without the colour classifier *màu*. According to my informants this is not possible.

(3) đỏ thì tôi ?(chi) nhìn_ thấy hai quyển sách. (Fanselow & Féry 2006, p. 48)
red TOP I only see two CLF book
‘As for red things, I only saw two books.’

1.12 Types of discontinuous noun phrases

Depending on the author, different types of discontinuous noun phrases are assumed. In this section first of all simple and inverted splits (Fanselow & Féry 2006) are introduced, then cohesive and non-cohesive splits (Fanselow & Féry 2006). Afterwards gapless splits are presented (for example van Riemsdijk 1989, Fanselow & Cavar 2002, Ott 2012). In each section first of all the particular type of discontinuous noun phrases is presented, then I analyse whether this type also exists in Vietnamese.

1.12.1 Simple and inverted splits

Fanselow & Cavar (2002) propose a general distinction regarding whether a discontinuous noun phrase keeps its original constituent order or whether it is inverted. The following examples are from Serbo-Croatian: (56) shows a sentence containing a discontinuous noun phrase, whereas (57) shows its continuous equivalent. In the continuous noun phrase in (57) *kakav* ‘what kind’ occurs before *krov* ‘roof’, and this constituent order is preserved in (56). Therefore, the split construction in (56) is called *pull split*. Fanselow & Féry (2006, p. 12) also refer to these kinds of split constructions as *simple splits*.^{14 15}

(56) Na kakav je Ivan krov skočio?
 on what-kind has Ivan roof jumped
 ‘On what kind of roof has Ivan jumped?’ (Fanselow & Cavar 2002, p. 3)

(57) Na kakav krov je Ivan skočio?¹⁶
 on what-kind roof has Ivan jumped?
 ‘On what kind of roof has Ivan jumped?’

The other types of split constructions are the so-called *inverted splits*.¹⁷ These constructions constitute the main class of discontinuous noun phrases in German. It can be seen that the unmarked constituent order of (59) *viele Bücher* ‘many books’ is not present in (58), but that *Bücher* ‘books’ occurs before the quantifier *viele* ‘many’.

(58) Bücher habe ich viele.
 books have I many
 ‘I have many books.’

¹⁴ Note that the term *simple split* is used by Ott (2012) in a completely different way, namely to designate NP split constructions that contain a gap (cf. p. 2).

¹⁵ In Fanselow & Féry (in prep.) this type of split is called a hierarchy-preserving split.

¹⁶ Thanks to Anja Šarić for providing this example.

¹⁷ In Fanselow & Féry (in prep.) this type of split is called a hierarchy-inverting split.

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(59) Ich habe viele Bücher.

I have many books

‘I have many books.’

In Vietnamese, inverted splits are also the main type of split constructions. From (61) it can be seen that in the unmarked constituent order, the numeral-classifier complex occurs before the noun, whereas in the split construction in (60) the noun is at the beginning of the sentence.

(60) Sách tôi mua năm quyển.

book I buy five CLF

‘I buy five books.’

(61) Tôi mua năm quyển sách.

I buy five CLF book

‘I buy five books.’

At first glance, it seems that Vietnamese also has simple splits. In (62) three instances of simple split seem to occur: *về chính trị* ‘about politics’ is separated from *báo* ‘newspaper/s’, *về phụ nữ* ‘about women’ is separated from *tạp chí* ‘magazine’ and *về vật lý* ‘about physics’ is separated from *sách* ‘book’. For all the examples, the unmarked constituent order of the noun phrases, see example (63), is preserved. However, it turns out that these are cases of extraction since *về X* ‘about X’ can be analysed as a prepositional phrase.

(62) Context: Lien reads a lot of books and news papers:

Báo thì đọc về chính trị, tạp chí thì đọc về
newspaper TOP read about politics magazine TOP read about

phụ nữ và sách thì đọc về vật lý.

woman and book TOP read about physics

‘She reads (a) newspaper/s about politics, (a) magazine/s about women and (a) book/s about physics.’

(63) Chị Liên đọc báo về chính trị, tạp chí về
older sister Lien read newspaper about politics magazine about

phụ nữ và sách về vật lý.

women and book about physics

‘Lien reads (a) newspaper/s about politics, (a) magazine/s about woman and (a) book/s about physics.’

1.12.2 Cohesive and non-cohesive splits

Fanselow & Féry (2006) argue that there is a connection between the different kinds of discontinuous noun phrases and their intonation. From a prosodic point of view, discontinuous noun phrases may occur in two varieties: as cohesive and non-cohesive. These structures are defined in the following way:

Cohesive discontinuous noun phrases are integrated into a single Intonation Phrase (henceforth i-phrase) whereas the two parts of a non-cohesive discontinuous noun phrases are separated into two i-phrases. (Fanselow & Féry 2006, p. 4)

Generally speaking, simple splits tend to be cohesive, whereas inverted splits are non-cohesive. However, this does not have to be the case in every language (cf. Fanselow & Féry 2006, p. 5). In Vietnamese, discontinuous noun phrases are rather cohesive since the intonation phrase is not involved in the formation of a discontinuous noun phrase (see Chapter 5). However, more research needs to be done in order to better analyse the role of the intonation phrase in Vietnamese.

1.12.3 Gapless splits

In earlier research on discontinuous noun phrases, gapless splits were among the observations made by linguists. Gapless splits contain two full nouns where the first noun is a general expression (superset) and the second noun is a more specific expression (subset) (for gapless splits, see for example Fanselow 1993, Ott 2012, Puig Waldmüller 2006, Fanselow & Cavar 2002). For the terminology *gapless split*, see Ott (2012).

Van Riemsdijk (1989) shows gapless splits in Japanese (example (64)) and Chinese (example (65)).

(64) Kudamono-wa ringo-o kaimasi-ta
fruit-TOP apples-OBJ bought
'As for fruit, I bought apples.'
(van Riemsdijk 1989, p. 111)

(65) Shuiguo, wo zui xihuan xianjiao
fruit I most like banana
'As for fruit, I like bananas most.'

(Huang 1982, p. 86, quoted by van Riemsdijk 1989, p. 111)

However, van Riemsdijk (1989) assumes that in German such constructions do not exist, but that the remainder has to be elliptical (cf. p. 111). A later study by Fanselow & Cavar (2002), shows that 10 out of 45 informants accepted gapless splits, whereas 17 of the informants rated them as questionable (cf. p. 99). In his dissertation (Ott 2012) and joint paper (Ott & Nicolae 2010), Ott concludes based on his native speaker intuitions that gapless splits are fully productive in German. Personally, I also assume that gapless splits exist in German based both on my knowledge as a linguist and on my native speaker intuitions. However, there is more research needed (both corpus studies as well as experiments) in order to determine the exact conditions in which gapless splits occur.

Vietnamese possesses gapless splits as in (66). In this example *xe hơi nhật* ‘Japanese cars’ and *xe hơi Đức* ‘German cars’ constitute the topics and *Toyota* and *Volkswagen* are the remainders.

(66) Context: A: What kind of foreign cars do you like?

B: Xe hơi nhật thì anh thích Toyota còn xe hơi
 car Japanese TOP older brother like Toyota and car
Đức thì thích Volkswagen
 German TOP like Volkswagen

‘As for Japanese cars, I like Toyota, and as for German cars, I like Volkswagen.’

1.12.4 Split PPs

In German we find split constructions that involve prepositions as in (67) or (68).

(67) In Schlössern habe ich noch in keinen gewohnt.
 in castles have I so far in none lived

‘As for castles, I haven’t lived in any so far.’ (Fanselow and Cavar 2002, p. 69)

(68) Selbst für Freunde würde ich so etwas nur für ganz
 even for friends would I such something only for very
enge tun.
 close do

‘Even for friends, I would do such a thing only for very close ones.’ (Ott 2012, p. 6)

As can be seen from (67) and (68), in both of the examples there are repetitions of the pronouns. In Vietnamese PP-splits do not exist. The reason for this seems to be that in Vietnamese prepositions cannot be used so freely and they cannot be stranded.

1.12.5 Multiple splits

Multiple splits involve more than two parts of a noun phrase that are separated from each other. (69) is a German example of a sentence with multiple splits and in (70) an example from Croatian is shown (see also Ott 2012).

(69) Bücher hat man damals interessante in den Osten keine
books has one then interesting in the East no
mitnehmen dürfen.
with-take may

‘As for books, one could not take any interesting ones to the East then.’

(Fanselow & Cavar 2002, p. 2)

(70) Koje je Ivan zanimljive kupio knjige?
which is Ivan interesting bought books

‘Which interesting books did Ivan buy?’

(Fanselow & Cavar 2002, p. 2)

Fanselow & Cavar (2002) note that speakers differ in the degree to which they accept multiple splits. This might be due to the fact that they are licensed by a pragmatically complex context (cf. p. 31). Due to this pragmatically complex context, we will not address multiple splits in this book.

1.12.6 Mixed splits

When it comes to *mixed splits* (for this terminology, see van Hoof 2006, as well as Ott 2012), a whole VP is fronted as in (71) and (72). The term *mixed splits* arose because both noun phrase and verb phrase are intuitively discontinuous (cf. Ott 2012, p. 8).

(71) Bücher geschrieben hat er noch keine.
books written has he yet none

‘He has not yet written any books.’

(72) Mädchen verführt hat er schon viele.
girls seduced has he already many

‘He has already seduced many girls.’

As mentioned by Ott (2012), *mixed splits* may also occur with other types of splits, for example split PPs as in (73).

- (73) In Schlössern gewohnt hat er noch in keinen.
 in castles lived has he yet in none
 ‘He has not yet lived in any castles.’

Vietnamese also displays mixed splits as in (74).

- (74) Context: Today Y works a lot in the kitchen.
Cắt cà-rốt thì cắt 4 ký, bóc vỏ hành thì bóc 10
 cut carrot TOP cut 4 kilo peel onion TOP peel 10
củ và pha cà phê thì pha 4 lít.
 CLF and boil coffee TOP boil 4 litres
 ‘She cut/s 4 kilos of carrots, peeled 10 onions and boiled 4 litres of coffee.’

Note that in Vietnamese the verb needs to be repeated in order to form a grammatical sentence. However, this is not only the case for mixed splits but in verb topicalization in general. In (75) the verb *đọc* ‘read’ occurs before the topic marker *thì* and is then combined with the noun phrase *sách* ‘book’.

- (75) Đọc thì nó nên đọc sách.
 read TOP s/he should read book
 ‘As for reading, he should read books.’ (Trịnh 2011, p. 38)

1.12.7 Properties of the different parts of discontinuous noun phrases

The two parts of a discontinuous noun phrase are connected to another. According to Fanselow (1988), both parts of a discontinuous NP are able to form an NP on their own, furthermore they share one theta-role. The NP (first part of a discontinuous noun phrase) is non-referring and has an open argument position, whereas the remnant determines the theta-role of the construction as a whole.

Ott’s (2012) main assumption is that there is an asymmetry between NP and remnant: “In STC’s (split topics),¹⁸ TOP¹⁹ is a property-denoting bare NP; REM [remnant] is a full DP.” (p. 63). More precisely the NP is an “open expression” (p. 63) following Fanselow (1988)

It denotes a property of the individual(s) denoted by REM: the *eine aus Berlin* that Fabian knows has the property GOOD NEWSPAPER; the *Eichhörnchen und Capybaras* that Christine likes have the property RODENT. STCs

¹⁸ In our terminology it would be discontinuous noun phrases or split constructions.

¹⁹ In our terminology NP.

feature an individual-denoting DP (an argument) and an NP expressing a property of the individuals denoted by that argument; by topicalizing the predicate, it restricts the interpretation of the comment to that property (Ott 2012, p. 63).

1.13 Structure of this book

This book is structured in the following way: First, Vietnamese classifiers are presented in Chapter 2. Classifiers play an important role in the discussion of discontinuous noun phrases since they are often involved in them. I claim that distinguishing between classified and unclassified noun, as well as optionally classified nouns is necessary to analyse discontinuous noun phrases with classifiers in Vietnamese. Furthermore, it is shown what classifiers are and how they are defined and categorized by different authors (mainly Aikhenvald 2000, Dixon 1986 and Grinevald 2002). Problematic issues regarding classifiers will also be discussed.

In Chapter 3, the syntax of NP split constructions is presented. I propose a base-generation analysis for Vietnamese. This proposal is different from Trính's (2011) movement analysis. The main argument for the base-generation analysis is that in Vietnamese constituents that are found in the remnant, for example numeral-classifier complexes can occur as stranded constituents in other contexts. Furthermore, some types of discontinuous noun phrases in Vietnamese (gapless splits and certain compound constructions) do not have a continuous equivalent.

Chapter 4 is about Vietnamese tones, intonation and prosodic structure. First, lexical tones in Northern and Southern Vietnamese are presented. Then, I propose a prosodic hierarchy for Vietnamese. Contrary to Schiering et al. (2010), I assume the existence of the prosodic word in Vietnamese. My argument is based on the analysis of reduplications and loan words. Overall, the proposed prosodic hierarchy contains the levels syllable, prosodic word, prosodic phrase and intonation phrase. Moreover, this chapter gives an overview of the literature on prosodic structure, intonation effects like tonal coarticulation and effects associated with communicative functions and information structure in Vietnamese.

In Chapter 5 two empirical studies on the prosody of discontinuous noun phrases in Vietnamese, are presented. It is shown that both Northern and Southern Vietnamese display final lengthening effects at the prosodic phrase boundary. Furthermore, the rising tone is clearly rising at the prosodic phrase boundary, but may be level or even falling when it occurs prosodic phrase-internally.

Chapter 1

In the last chapter (Chapter 6), the findings are summarized and a conclusion wraps up the book.

Chapter 2 Classifiers

2.1 Introduction

Classifiers are function words that categorize nouns. Despite many differences in the literature the term *classifier* is mostly used in order to refer to *numeral-classifiers*. These classifiers are used to make nouns countable. Furthermore, classifiers mostly display a semantic connection between themselves and the noun; they “serve to classify objects according to their shape, function and other semantic features often culturally defined.” (Lee 2000, p. 1). An example of a Vietnamese classifier is shown in (1). The classifier *trái* in (1) is a classifier for fruits and other round objects, the noun *chuối* ‘banana’, for example, is underspecified for number and cannot be connected with a numeral directly. Therefore, the classifier serves as a “mediator” between noun and numeral.

- (1) một trái chuối
 one CLF banana
 ‘one banana’

However, when taking a closer look at how individual authors treat and define classifiers, a great amount of variation can be observed.

In this chapter, I will present the connection between discontinuous noun phrases and classifiers and present my own research on this topic (Section 2.2). Then the views of different authors on how to categorize the different types of classifiers will be presented (2.3). Section 2.4 treats remaining problems of classifiers in Vietnamese, and the final section (2.5) sums up the chapter.

2.2 Classifiers and discontinuous noun phrases in Vietnamese¹

The presence or absence of classifiers plays an important role in the analysis of discontinuous noun phrases, since classifiers are often present in a split construction; see the following example:

- (2) Context: Today Mrs Hoa buys/bought a lot of things.
Sách mua hai quyển, còn viết thì mua ba cây.
book buy two CLF and write TOP buy three CLF
‘Today Mrs. Hoa buys/bought two books and three pens.’

¹ Parts of this section were published in Duong Phu (2017).

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In (2) the classifier *quyển* (classifier for bound objects) combined with the numeral *hai* ‘two’ is separated from its head noun *sách* ‘book’. In this case, the numeral cannot occur without a classifier since words like *sách* need a classifier in order to be countable, as illustrated in (3) and (4). This observation has led researchers to assume that Vietnamese is a “numeral-classifier language” (cf. for example Aikhenvald 2000, Grinevald 2002). Numeral-classifier languages are classifier languages in which the main or only function of classifiers is to make nouns countable.

However, not all Vietnamese nouns need a classifier in order to be countable. Some nouns may be directly connected with a numeral, as can be seen in the examples (5)-(7):

(3) *bốn sách
four book
‘four books’

(4) bốn quyển sách
four CLF book
‘four books’

(5) một ngày
one day
‘one day’

(6) hai sinh viên
two student
‘two students’

(7) ba câu
three sentence
‘three sentences’

The observation that in a numeral-classifier language, not all nouns are necessarily associated with a classifier, has been made by Dixon (1986) and Aikhenvald (2000).

Not all authors consider the possibility that in a classifier language a noun may be directly connected to a numeral. For Chierchia (2010, p. 7) for instance, it is impossible for a noun of a classifier language to be directly combined with a numeral. However, the data we find on Vietnamese noun phrases speaks against this view.

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One might assume that discontinuous noun phrases that involve nouns that do not need a classifier to be countable, would behave similarly to other discontinuous noun phrases, just leaving the classifier out. However, this does not seem to be the case as shown in the following example:

- (8) ?*Ngày, tôi ở lại năm.
day I stay five

‘Days, I stayed for five.’

(T. H. Nguyễn 2004, p. 102)

In (8) it is not possible for the numeral *năm* ‘five’ to appear on its own, separated from its head noun *ngày* ‘day’, a noun which does not take a classifier. My own investigations confirm that sentences like (8) are rather difficult. The nouns *cô* ‘aunt’ and *chú* ‘uncle’ in example (9) do not need a classifier to be countable. Therefore, numerals like *bốn* ‘four’ can be directly connected to *cô* ‘aunt’: *năm cô* ‘five aunts’. However, simply separating the numeral from the noun in a discontinuous noun phrase like (9) is not very acceptable. (9) was accepted by one informant, but another informant evaluated it as barely acceptable. The unacceptability of (9) is most likely due to the tendency for numerals in Vietnamese to usually not occur on their own: (10) could be uttered in a market setting, where somebody wants to buy two pieces of fruit. The speaker uses the numeral-classifier construction *hai trái* ‘two CLF’ and not just *hai* ‘two’ to refer to the two pieces of fruit. Note that in languages like German, the speaker could use the numeral *zwei* ‘two’ as pronoun in order to refer to two pieces of fruit.

- (9) Context: Huong has a lot of uncles and aunts:

? Chú² thì có bốn và cô³ thì có năm.
uncle TOP have four and aunt TOP have five

‘Huong has a lot of uncle and aunts: four uncles and five aunts.’

- (10) Bán cho tôi hai trái.
sell for I two CLF

‘Sell me two (of them).’

(cf. Lê 2008)

However, some Vietnamese nouns that are countable without a classifier may take a classifier when they are counted, as can be seen from the following examples:

² Younger brother of one’s father.

³ Younger sister of one’s father.

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(11) hai (người) cô
two (CLF) aunt
'two aunts'

(12) ba (người) chú
three (CLF) uncle
'three uncles'

When it comes to discontinuous noun phrases, sentences containing nouns taking an optional classifier, seem to be better when they occur with a classifier as in (13).

(13) Context: Huong has a lot of uncles and aunts:

Chú⁴ thì có bốn người và cô⁵ thì có năm người.
uncle TOP have four CLF and aunt TOP have five CLF
'She has four uncles and five aunts.'

In short, discontinuous NPs are acceptable when a classifier is separated from its noun, but not when an unclassified noun is separated from other parts of the NP (for example, a numeral). However, sentences with discontinuous NPs are better when nouns that take an optional classifier occur with the classifier.

Trình (2011) proposes a general distinction between relational and non-relational nouns, while analysing discontinuous noun phrases. For non-relational nouns, no doubling of head nouns is possible when they appear without a complement:

(14) Sách thì nó sẽ mua hai quyển *sách.
book TOP he will buy two CLF *book
'He will buy two books.'

(Trình 2011, p. 79)

Concerning relational nouns without a complement as the second part of a discontinuous noun phrase, doubling of the fronted noun is optional:

(15) Bạn thì nó sẽ gặp hai người (bạn).
friend TOP he will meet two CLF friend
'As for friends, he will meet two friends'

(Trình 2011, p. 20)

⁴ Younger brother of one's father.

⁵ Younger sister of one's father.

According to my own observations, it is not the distinction between relational and non-relational nouns that is relevant, but rather whether a noun takes a classifier or not and whether this classifier is optional or not.

The different behaviour of (14) and (15) may be explained by the fact that *sách* ‘book’ needs a classifier to be counted, whereas with *bạn* ‘friend’ the classifier is only optional. Obviously, noun doubling is possible either with nouns that take an optional classifier or with nouns that do not take a classifier at all, as in (16).

In (16), the nouns *ngày* ‘day’, *giờ* ‘hour’, *phút* ‘minute’ and *giây* ‘second’ are all non-relational and do not take a classifier. Still, doubling is possible. It seems that these nouns may function as “their own classifier”. Note that *ngày* may also be analysed as a *measural classifier* in Grinevald's (2002) terminology. Measural classifiers are measure terms (for example *piece* in *piece of cake*) in classifier languages (cf. Section 2.4.6). Therefore, depending on the theory *ngày* may also well be a classifier. However, even if we assume that measure terms are different from numeral-classifiers as in Aikhenvald (2000) they still have a lot in common. Both, make countable an entity that cannot be counted directly. The abstract concept of time, for instance, cannot be counted, but a measure term like *day* makes it countable.

(16) Context: Hoa’s boyfriend went far away because of his work, therefore Hoa is very lonely and misses him. So Hoa counts every second, every minute, every hour and every day until her boyfriend returns:

<u>Ngày</u>	thì	đếm	<u>7 ngày, giờ</u>	thì	đếm	<u>168</u>	<u>giờ</u> ,	<u>phút</u>	thì
day	TOP	count	7 day hour	TOP	count	168	hour	minute	TOP
đếm	<u>10080</u>	<u>phút</u>	và	<u>giây</u>	thì	đếm	<u>604800</u>	<u>giây</u> .	
count	10080	minute	and	second	TOP	count	604800	second	

‘She counts 7 days, 168 hours, 10,080 minutes and 604,800 seconds.’

One reviewer⁶ proposed that words like *ngày* ‘day’ might also be analysed as being a fusion of classifier and noun. However, this does not seem plausible since it is not possible to have a CLF+noun at the beginning of a sentence containing a discontinuous NP:

⁶ The Semantics of African, Asian and Austronesian Languages (TripleA 3) workshop, Eberhard-Karls University of Tübingen, July 5-8, 2016.

(17) Context: A (small) child likes animals a lot and wants to raise some:

*Con chó thì ba con và con thỏ thì hai con.
CLF dog TOP three CLF and CLF rabbit TOP two CLF
'S/he wants to raise three dogs and two rabbits.'

To sum up, the examples (8), (9) and (13) show there is an influence of classifiers and different kinds of noun classes in Vietnamese. It is necessary to consider a noun's properties with regard to classifiers in order to correctly analyse NP split constructions in Vietnamese. The distinction between relational/non-relational nouns as proposed by Trịnh (2011) does not seem to be relevant.

2.3 Different approaches towards classifiers – Types of classifiers

Aikhenvald (2000, p. 1) uses

the term 'classifier' ... as an umbrella label for a wide range of noun categorization devices Different types of classifiers can be distinguished by their grammatical status, degree of grammaticalization, condition of use, meaning, kind of origin, mode of acquisition, and tendencies towards its loss.

According to Aikhenvald (2000), the class of classifiers occurring in languages like English, German or French comprises grammatical agreement classes or genders that are based on semantic characteristics such as animacy, sex or humanness.

Examples (18) and (19) are examples taken from French. (18) shows that the feminine article occurs in front of the noun *femme* 'woman' and in (19) the masculine article *le* occurs before the noun *garçon* 'boy'. In these cases, the semantic properties of the nouns are reflected in the choice of article. However, for the great majority of French nouns this is not the case. For inanimate objects, for example, there is no reason to assume that they are semantically feminine or masculine. Still, according to French grammar all nouns have to take feminine or masculine gender. This is a big difference compared to classifier languages like Vietnamese, where nouns take a specific classifier mainly for semantic reasons. Therefore, the categorization of languages with gender systems as classifier languages as done by Aikhenvald (2000) does not seem to be helpful. In order to refer to both gender and classifier system, the term "noun categorization" seems to be appropriate.

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(18) la femme
 the.F woman
 ‘the woman’

(19) le garçon
 the.M boy
 ‘the boy’

(20) le lit
 the.M bed
 ‘the bed’

The second type of classifiers assumed by Aikhenvald (2000) are the so-called ‘numeral-classifiers’, where a special morpheme appears next to a numeral or quantifier. These are the kinds of classifiers we find in Vietnamese; see the examples (21) and (22). In these cases, the classifier makes the noun countable.

(21) hai quả chuối
 two CLF (fruit) banana
 ‘two bananas’

(22) bốn con bò
 four CLF (+animate) cow
 ‘two cows’

Relational classifiers are morphemes that “characterize the way in which the referent of a possessed noun relates to the possessor” (Aikhenvald 2000, p. 2). These kinds of classifiers are found in Fijian, an Austronesian language. In (23) and (24) the classifier reveals what kind of relationship the speaker has towards kava⁷.

(23) na me-qu yaqona
 ART CLF: drinkable-my kava
 ‘my kava (which I intend to drink)’

(Aikhenvald 2000, p. 3)

⁷ A non-alcoholic beverage consumed on most of the Pacific Islands.

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- (24) na no-qu yaqona
 ART CLF:general-my kava
 ‘my kava (that I grew, or that I will sell)’ (Aikhenvald 2000, p. 3)

Verbal classifiers are classifiers on the verb, but they characterize the noun (typically an indirect subject or direct object). In (25), an example of Waris (a Papuan language), the verbal classifier is a part of the verb, but classifies the noun as being round.

- (25) sa ka-m put-ra-ho-o
 coconut 1SG-to VCLF:round-get-benefact-imperative
 ‘Give me a coconut (lit. ‘coconut to-me round one give’)’ (Aikhenvald 2000, p. 3).

Deictic classifiers are classifiers that are associated with deictics and articles as in Mandan, a Siouan language:

- (26) de-māk
 this-one (lying)
 ‘this one lying’

- (27) de-nak
 this-one (sitting)
 ‘this one sitting’ (Aikhenvald 2000, p. 3)

Vietnamese also possesses deictic classifiers. In example (28), the highlighted classifier *cuốn* is a deictic one. However, as can be seen from A’s question *cuốn* may also occur as a simple noun classifier.

- (28) A: Anh muốn cuốn sách nào?
 older brother want CLF book which
 B: **Cuốn** kia.
 CLF that
 ‘A: Which book do you want? B: That one.’ (Aikhenvald 2000, p. 211)

Taking a closer look at the examples from Mandan (examples (26) and (27)), as well as the answer in the Vietnamese example (28), it becomes clear that all these examples lack an overt head noun. The classifiers occur on their own as a “pronoun”. (For more information on the use of classifiers as pronouns see Section 2.4.1.3). For Vietnamese, deictic classifiers do not only

occur without a head noun. In (29) the head noun-classifier complex is connected to the deictic *kia* ‘that’.

- (29) Tôi mua **cuốn** **sách** **kia**.
 I buy CLF book that
 ‘I buy that book.’

However, *cuốn* also has other functions: it may serve as a numeral-classifier as in (30).

- (30) Tôi mua hai **cuốn** sách.
 I buy two CLF book
 ‘I buy two books.’

The classifier *cuốn* in (28)A may be analysed as a wh-word classifier since it occurs with a wh-word. Again this type of classifier can function as pronoun, as shown in (31).

- (31) Anh mua **cuốn** nào?
 older brother want CLF which
 ‘Which one did you buy?’

As can be seen from the examples in Vietnamese, a single classifier may be used as a noun (32), a wh-word⁸ ((28)A), a deictic (answer in (28)), and as a numeral-classifier (30). Therefore, Aikhenvald (2000) categorizes Vietnamese as a *multiple classifier language* (p. 204).

- (32) Tôi mua cuốn sách.
 I buy CLF book
 ‘I buy (a) book.’

Dixon (1986) explains that ‘loaves’ in ‘three loaves of bread’ or ‘pairs’ in ‘two pairs of trousers’ are similar to numeral-classifiers in languages like Chinese. The only difference is that English classifiers do not occur so frequently and also have a limited distribution.

For Dixon (1986) there are two major types of noun categorization devices, namely noun classes (with their noun class markers) and classifiers. Noun classes are a typical phenomenon in African languages, whereas classifiers are typical for languages from East and South East Asia. However, noun classes also occur in Indo-European and Semitic languages, but their number is not so large compared to African languages. While noun classes seem to correlate

⁸ My own categorization, not assumed by Aikhenvald (2000).

with inflectional or agglutinating languages, classifier languages are rather isolating or “mildly” agglutinating languages (cf. Dixon 1986, p. 218). Furthermore, noun classes constitute an obligatory grammatical system and closed grammatical class, whereas with classifiers it is often difficult to list all classifiers of a language and there also may be diverging opinions on this. Therefore, classifiers constitute a “semi-open” lexical-like system in a language. While in languages with noun classes, a noun usually belongs to one single class⁹, in classifier languages, a noun may take different classifiers. A change of classifier may result in a change of meaning or in a change of style (cf. Dixon 1986).

In Vietnamese, for example, the noun *đường* ‘street’ may take either the classifier *con*, which is the traditional classifier, as in (33), or the classifier *cái*, as in (34), which is more often used in colloquial speech. In modern Vietnamese *con* is mostly used as a classifier for animals, therefore it may be difficult to understand from a synchronic point of view why inanimate objects like ‘street’ or ‘knife’ are also classified with *con*. *Cái* is a classifier for inanimate objects, which makes it easier to understand why it should be used with streets. However, Löbel (1996, p. 138-139) mentions that objects like ‘street’ or ‘knife’ can be described as “moveable”, since a street may have the shape of a moving snake and a knife may be moved while cutting something. Still, chopsticks may be moved when they are used and do not occur with the classifier *con*. Thus, Löbel’s explanation is not applicable for all Vietnamese nouns.

(33) *con* *đường*
 CLF street
 ‘(the) street’

(34) *cái* *đường*
 CLF street
 ‘(the) street’

Grinevald (2002) distinguishes between noun, numeral, genitive and verbal classifiers. Genitive classifiers are comparable to what Aikhenvald (2000) refers to as *relational classifiers* (see above p. 41-42). Also Grinevald (2002) and Aikhenvald (2000) seem to understand similar concepts under the notion of *verbal classifiers* (see above p. 42).

⁹ There are exceptions to this generalisation. In Tagbana (Senufo language) some nouns may take several noun classes (Thanks to Yranahan Traoré for information and discussion on his native langue).

However, distinguishing between noun and numeral-classifiers may be new. For Dixon (1986) all classifiers are numeral-classifiers: “A classifier will always occur next to the numeral, making up a closely bound syntactic unit numeral + classifier, or classifier + numeral.” (p. 1). This seems to be questionable for Vietnamese, since in this language, classifiers may occur without numeral or quantifier, as in (35). The term *noun classifier* used by Grinevald (2002) is thus a useful term to describe the occurrence of the classifier in (35).

- (35) Tôi thấy con chó.
 I see CLF dog
 ‘I see (a) dog.’

According to Greenberg (1972) “The classifier is an individualizer which performs the same function as a singulative derivational affix in languages with the collective/singulative opposition.” (p. 26). This means that in (35) the classifier is seen as an item licensing a singular reading. Greenberg (1972) also mentions that “Numeral-classifier languages generally do not have compulsory expression of nominal plurality, but at most facultative expression.” (p. 17). This connection may strengthen the hypothesis that classifiers also function as “individualizers” in languages where nouns are underspecified in terms of plurality. The effect of individualization may be achieved by “designating the semantic boundaries [of a count noun]” (Bisang 1999, p. 120).

However, there might also be language-specific differences as to whether a numeral-classifier of a particular language may occur outside the context of counting. According to Bisang (1999), in Modern Standard Chinese and Japanese the main function of classifiers is to make nouns countable and to classify them, whereas in Vietnamese the classifiers may occur outside the context of counting in order to individualize and classify the noun (cf. p. 113). Simpson (2005) mentions that many languages in South East Asia have the structure “numeral-classifier-noun”, but that the structure “classifier-noun” as found in Vietnamese, Hmong and Nung is rather rare.

2.4 Problems with classifiers in Vietnamese

As described above Vietnamese is a numeral-classifier language. In this section, the variety of different usages of classifiers (2.4.1) is described as well as possible sources of confusion of classifiers with other phenomena. The first source of confusion regarding classifiers is measure phrases as in 2.4.2. In 2.4.3, the difference between classifier and compound is explained. The next section (2.4.4) presents a proposal for class term compounds. The distinction between

‘classified’ and ‘unclassified’ nouns is discussed in Section 2.4.5. Furthermore, 2.4.6 addresses the derivation of classifiers in Vietnamese.

2.4.1 *Functions of classifiers*

In this section different functions of the Vietnamese classifier will be discussed. It will be shown that counting is by no means the only function of classifiers in Vietnamese. Classifiers may also function as normalizers (2.4.1.1), as honorific forms (2.4.1.2) and as pronouns (2.4.1.3).

2.4.1.1 *Classifiers as nominalizers*

Vietnamese classifiers may function as nominalizers of verbs or adjectives (stative verbs). In (36) the stative verb *khỏe* ‘to be healthy’ becomes the noun ‘health’ with the help of the classifier *sức*. The general meaning of *sức* is ‘power, strength’. In (37) the classifier *sự*, which is a classifier for abstract things, turns the verb *sống* ‘to live’ into the noun ‘life’.

(36) *sức* *khỏe*
CLF (to be) healthy
‘health’

(37) *sự* *sống*
CLF (to) live
‘life’

2.4.1.2 *Classifiers as honorific forms*

Vietnamese uses nouns that are taken from family relationships (e.g. uncle, aunt, grandfather, grandmother) in order to politely refer to another person. Examples (38) through (41) all have the meaning ‘Dung goes to work’. However, the social relationship of the speaker and his or her interlocutor towards Dung is different in all contexts. In (38) Dung is younger than the speaker/interlocutor or has a lower social status. In (39) Dung is older than the speaker/interlocutor or has a higher social status, but is still in about the same generation as the speaker/interlocutor. The term *chú* ‘uncle (younger brother of one’s father)’ in (40) is used to refer to a person who is about one generation older than the speaker/interlocutor or to a younger male of whom the speaker wants to speak in a polite way. *Ông* ‘grandfather’ in (41) is a very respectful way to refer to another male person, however it is also generally used for someone who is about two generations older than the speaker/interlocutor.

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- (38) **Em** Dũng đi làm.
younger sibling Dũng go to work
'Dung goes to work.'
- (39) **Anh** Dũng đi làm.
older brother Dũng go to work
'Dung goes to work.'
- (40) **Chú** Dũng đi làm.
younger uncle Dũng go to work
'Mr Dung goes to work.'
- (41) **Ông** Dũng đi làm.
grandfather Dũng go to work
'Mr. Dung goes to work.'

Note that the speaker may choose to use a noun of family relation based on his/her interlocutor's relationship to the person, talked about, especially when the interlocutor is a child.

The nouns taken from family relations may be analysed as classifiers since they classify proper nouns according to social relations. However, proper nouns are not the only words classified by family terms; for other nouns denoting people such family terms may have the same function as well. In (42) the term *anh* 'older brother' is used to classify *ca sĩ* 'singer', in (43) the term *ông* 'grandfather' is used to classify *giáo sư* 'professor'.

- (42) **anh** ca sĩ
older brother singer
'(male) singer'
- (43) **ông** giáo sư
grandfather professor
'(male) professor'

Nouns taken from family relations connected to a proper noun or profession may also be analysed as a title comparable to *Mr* and *Mrs* in English. Since classifiers in Vietnamese constitute a semi-open class (see Section 2.3) both analyses are possible.

2.4.1.3 *Classifiers as pronouns*

Several authors have argued that classifiers may also function as pronouns (for example P. P. Nguyễn 2002, p. 21-22, Lê 2008, p. 21).

We find the following example in (44):

- (44) Bán cho tôi hai con. (Lê 2008, p. 21)
sell for I two CLF (+ animate)
'Sell me two ones.'

(44) could be uttered in a context where the speaker is at the market and wants to buy two chickens for example.

2.4.2 *Distinction between classifiers and measure phrases*

An important question concerning classifiers is the difference between measure phrases and classifiers. According to Aikhenvald (2000), this is a general problem of numeral-classifier languages. The question is whether a phrase like “kilo” in (45) may be analysed as a classifier or whether it constitutes a different category.

- (45) một kí-lô gạo
one kilo rice
'one kilo of rice'

Several authors have argued that constructions as in (45) are not part of the group of classifiers since they have different properties.

Löbel (1995) proposes that measure phrases are not as tightly connected to the noun as classifiers since they may be separated by certain stative verbs such as *đầy* '(to be) full of', and *ruỡi* 'half of' in (46) and (47).

- (46) một bao ruỡi cam
one bag half orange
'one and a half bags of oranges'

- (47) một lít đầy sữa
one litre full milk
'(exactly) one litre of milk (and not less)' (Löbel 1995, p. 23)

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This is not possible with classifiers. If a classifier is present, stative verbs may only appear after the noun. P. P. Nguyễn (1995) argues in a similar way, citing examples containing the stative verbs *già* ‘to be old’ and *non* ‘to be young’:

(48) một kí già/non táo
one kilo old/young apple
‘one kilo more/less apples’ (P. P. Nguyễn 1995, p. 41)

(49) *một trái già/non táo
one CLF (fruit) (be) old/young apple
‘one apple more/less’ (P. P. Nguyễn 1995, p. 41)

T. H. Nguyễn (2004) also observes that measure nouns may be modified. Possessive phrases and demonstratives seem to have a similar function to adjectives (stative verbs):

(50) một [xe của tôi] cát
one vehicle of I sand
‘[my truck]’s worth of sand’

(51) một [bát này] đường
one bowl this sugar
‘[this bowl]’s worth of sugar’ (T. H. Nguyễn 2004, p. 22-23)

According to T. H. Nguyễn (2004), there are not only lexical and grammatical differences between measure nouns and classifiers, but also phonological ones. Measure nouns are stressed, whereas classifiers are not. This is due to the fact that classifiers are function words, but measure phrases are not (p. 21-24).

J. Trần (2011) mentions further differences between measure nouns and classifiers. First, measure nouns occur in all languages whereas classifiers only appear in some languages. Second, classifiers may be omitted in the case of ‘unclassified’ nouns, but when a numeral is connected with a mass noun, omission of the measure phrase is not possible. Third, classifiers may not be combined with each other, but with measure nouns this is possible as in (52).

(52) mỗi thước tác đất đai
every meter 10 cm land
‘every meter of land’ (Lê 2008, quoted in J. Trần 2011, p. 24)

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Discontinuous noun phrases are possible with classifier phrases as well as with measure phrases, as can be seen in the following example from P. P. Nguyễn (1995):

- (53) Táo nó mua một rổ lớn.
apple s/he buy one basket big
'He buys a big basket of apples.' (P. P. Nguyễn 1995, p. 45)

2.4.3 *Classifiers and compounds*

While analysing different classifier constructions, it is sometimes problematic to determine the classifier. For example, *bó hoa* 'bunch of flowers' may be analysed either as a compound (54) or as a combination of classifier and noun phrase (55).

- (54) [bó hoa]_N
bunch flower
'flower-bunch'

- (55) (một) bó hoa
(one) bunch flower
'(a) bunch of flowers' (Löbel 1995, p. 35)

Löbel (1995) observes the following intonation difference: "In the case of compound, stress is on the first element, whereas in a classifier construction, it is the last element which receives primary stress" (p. 34-35). However, Löbel (1995) did not conduct an empirical study to prove this statement and show what the correlates of stress in Vietnamese are. The study by Ingram & Nguyễn (2006) showed that there is generally no difference between phrase and compound in Vietnamese, but that the pauses between two words of a compound are longer under maximal contrast compared to phrases (see Section 4.3.2). I am unaware of any other study showing stress in Vietnamese in a systematic way. Therefore, I am assuming that there is no lexical stress in Vietnamese.

In order to make clear that a construction should be interpreted as a compound, it is also possible to add the classifier *cái* as in (56).

- (56) hai cái bó hoa
two CLF bunch flower
'two flower-bunches' (Löbel 1995, p. 35)

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P. P. Nguyễn (2002) suggests that compounds display a specific behaviour when they are moved to the beginning of a sentence, as in the following examples:

(57) Trâu bò, hai con vừa mới chết.
buffalo beef two CLF recently dead
'As for cattle, two of them died recently.'

(58) Nhà cửa, năm cái bị cháy.
house door five CLF suffer burn
'As for houses, five of them burned.'

(59) Tàu bè, ông A có mười chiếc.
boat raft grandfather A have ten CLF
'As for boats and rafts, Mr A has ten of them.'

(P. P. Nguyễn 2002, p. 35)

Considering examples (57)-(59), we see that, using our terminology, all these examples may be analysed as sentences containing discontinuous noun phrases, where the classifier-numeral complex is separated from its head noun.¹⁰ What makes these sentences special is that according to P. P. Nguyễn (2002) the noun phrases do not have continuous counter parts. In other words, it is not possible to connect compound and classifier in a continuous construction:

(60) *con trâu bò
CLF buffalo beef
'cattle'

(61) *cái nhà cửa
CLF house door
'house'

(62) *chiếc tàu bè
CLF boat raft
'boat'

(P. P. Nguyễn 2002, p. 35)

Still, connecting a classifier with each part of the compound is unproblematic as exemplified by the two parts of the compound *nhà cửa*:

¹⁰ (59) is the most typical discontinuous noun phrase among the three examples, since we find intervening material between the two parts of the noun phrase.

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(63) cái nhà
CLF house
'house'

(64) cái cửa
CLF door
'door'

(P. P. Nguyễn 2002, p. 32)

However, according to my own consultations with native speakers, it seems to be better to mark (60) - (62) with “?”, since the opinions about these noun phrases are not consistent.

2.4.4 *Class term compounds*

M. Phạm (2013) introduces the notion of ‘class term compounds’ which have mixed properties of both noun phrases and classifier phrases. Many class terms are directly countable without a classifier as in (65).

(65) ba phòng khách
three room guest
'three living rooms'

(M. Phạm 2013, p. 18)

Still, class term compounds may sometimes have an optional classifier as in (66).

(66) ba (chiếc) máy bay
three (CLF unit) machine fly
'three airplanes'

(M. Phạm 2013, p. 19)

Unlike classifiers, class term compounds are underspecified for number as in (67), whereas noun classifier complexes have a singular interpretation if they occur on their own.

(67) cây chuối
tree banana
'banana tree(s)'

(M. Phạm 2013, p. 19)

Furthermore, class term compounds may have a generic interpretation, which is not possible with classifier phrases. These latter phrases rather resembles bare nouns (cf. p. 4).

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- (68) Bánh chung ngon.
banh chung delicious
'Banh Chung¹¹ is delicious.'

When it comes to coordination, nouns may be coordinated under the same classifier (if the classifier is appropriate for both nouns) as can be seen in (69). Nevertheless, the first part of a class term compound cannot be the head for two coordinated nouns, as demonstrated in (70).

- (69) 100 trái chuối với cam
100 CLF:FRUIT banana and orange
'100 [oranges and bananas]' (M. Phạm 2013, p. 22)

- (70) *100 máy bay với giặt
100 machine fly and wash
'intended: 100 [airplanes and washing machines]' (M. Phạm 2013, p. 23)

Phạm (2013) also demonstrates that NP ellipsis may occur with class terms and with classifiers, as illustrated in the following examples.

- (71) Nếu mà ăn ba trái cam, tôi sẽ ăn ba trái
if 2SG eat three CLF orange 1SG FUT eat three CLF
(cam) luôn.
(orange) also
'If you eat three oranges, I will eat three ones as well.' (M. Phạm 2013, p. 23)

- (72) Nếu mà mua ba máy lạnh, tôi sẽ mua
if 2SG buy three machine cold 1SG FUT buy
ba máy (lạnh) luôn.
three machine (cold) also
'If you buy three air conditioners, I will buy three ones as well.' (M. Phạm 2013, p. 24)

However, NP ellipsis seems not to be possible with all class term compounds as shown in (73).

¹¹ Special Vietnamese rice cake.

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- (73) *Nếu mà mua ba máy bay, tôi sẽ mua ba
if 2SG buy three machine fly 1SG FUT buy three
máy (bay) luôn.
machine (fly) also
'If you buy three airplanes, I will buy three ones as well.' (M. Phạm 2013, p. 24)

When it comes to discontinuous noun phrases, there seem to be comparable discrepancies with class term compounds.

- (74) Context: Huong works as tree seller. Today she sold a lot of trees:
Chuối thì bán 10 cây, chanh thì bán 5 cây, mít thì bán
banana TOP sell 10 CLF lemon TOP sell 5 tree jackfruit TOP sell
8 cây và quýt thì bán 20 cây.
8 tree and mandarin TOP sell 20 tree
'She sold 10 banana trees, 5 lemon trees, 8 jackfruit trees and 20 mandarin trees.'

- (75) *Context: Huong likes to count vehicles very much
Đạp thì đếm 20 x h thì đếm 10
pedal TOP count 20 vehicle stream TOP count 10
còn lửa thì đếm 5¹².
and fire TOP count 5
'She counts 20 bicycles, 10 cars and 5 trains.'

Comparing (74) to (75), it seems that class term compounds with *cây* 'tree' may be separated and occur as discontinuous noun phrases, whereas class term compounds with *x* 'vehicle' may not. This observation and the discrepancy between (72) and (73) show that the group of class term compounds is far from being homogeneous.

One explanation for this could be that class term compounds with *cây* 'tree' and with *x* 'vehicle', as well as *máy lạnh* 'air-condition' and *máy bay* 'airplane' may be in a different state of grammaticalization.

¹² Note that the sentence might have been improved by using the construction *đếm được* 'can count' instead of only *đếm* 'count'. However, the general judgement of ungrammaticality would have been the same.

However, there might also be prosodic reasons why certain noun phrases are separated and others are not. In German, for example, if a single noun phrase contains more than one prosodic word, separation is possible:

- (76) hilf- und hoffnungslos: [[hilf]ω und [hoffnungs]ω [los]ω]ω
 ‘help- and hopeless’ (Höhle 1982, p. 89)

When one noun phrase contains only one prosodic word, coordination is not possible:

- (77) *salz- und mehlig
 ‘salt-and floury’ (Höhle 1982, p. 90)

2.4.5 *The distinction between ‘classified’ and ‘unclassified’ nouns*

Many Vietnamese grammars provide lists of nouns that occur with a classifier (the so called ‘classified nouns’) and those that do not take one (‘unclassified nouns’) (cf. for example Emeneau 1951, p. 100, 110-113, J. Trần 2011). Emeneau also mentions that some nouns belong to both classes, but still have a slightly different meaning depending on whether they occur with a classifier or without one. *Cái cửa* ‘CLF door’ for example means *door* (the physical object) whereas *cửa* without a classifier means *door* (as a means of entrance or exit) (Emeneau 1951, p. 95).

Cao (1998) rejects the division between classified and unclassified nouns. Instead he proposes that nouns which are directly countable are count nouns and those which are not, are mass nouns. He considers the concept of classifiers as being imposed by the West.

Löbel (1996) also proposes that the distinction between classified and unclassified nouns is not necessary, since this distinction can be traced back to semantic differences.

- (78) một làng ở huyện Nam-Xuong
 one village in district Nam-Xuong
 ‘the (one) village in the district Nam-Xuong’

- (79) một cái làng ở huyện Nam-Xuong
 one CLF village in district Nam-Xuong
 ‘a village in the district Nam-Xuong’ (Löbel 1995, p. 34)

In (78) there are other villages inferable from the context, whereas in (79) there is only one village in the district. However, to me there is no general rule of when a Vietnamese noun is

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interpreted a specific as in (78) or as inspecific as in (79) (see also Section 1.5). Therefore, I will not consider Löbel's claim further.

P. P. Nguyễn (1995) assumes the existence of zero and empty classifiers (“classificateur zero”, “classificateur vide”). Zero classification is found in cases where there is individuation, but no overt classifier. The zero classifier occurs in contexts where there is a quantifier preceding the noun and where the noun already constitutes a unit by itself in (80)-(84).

(80) một chỗ
 one place
 ‘one place’ →spatial unit

(81) một ngày
 one day
 ‘one day’ →temporal unit

(82) một cây
 one tree
 ‘one tree’ →object unit

(83) một nắm
 one handful
 ‘a handful’ →measurement unit

(84) một anh
 one older brother
 ‘one older brother’ →relational unit (P. P. Nguyễn 1995, p. 28)

Empty classifiers occur either in sentences without a quantifier or in cases where the classifier is deleted, as in the following example:

(85) Cần them hai bàn hai ghế nữa.
 need additional two table two chair more
 ‘Two additional tables and chairs are needed.’ (P. P. Nguyễn 1995, p. 28)

Usually the classifier *cái* ‘CLF inanimate’ occurs before *ghế* ‘chair’. I do not assume the existence of zero and empty classifiers, but rather that not all Vietnamese nouns take a classifier and that there may be classifier ellipsis.

2.4.6 Derivation of Vietnamese classifiers

M. Phạm (2013) proposes that Vietnamese classifiers have derived from class term compounds with class terms being reanalysed as classifiers.

Truong (1970), however, proposes the following development of the classifier *cái*:

Or, il semblerait, nous référant aux proverbes et chansons populaires qui nous sont transmis par l’ancien temps, que *cái* désignât tous les êtres animés ou non animé, et qu’il servît d’unique spécificatif général pouvant s’appliquer sans distinction à tous les substantifs. (p. 266)

It seems that, referring to traditional proverbs and songs that have been transmitted to us from the past, *cái* used to refer to all animate and inanimate beings, and to be a unique general classifier that could apply to all nouns without any distinction. (p. 266)

In order to support his argument Truong (1970) gives examples like the following from a traditional Vietnamese source:

(86) Cái cú, cái cáo cũng nháo về rừng.
 CLF owl CLF fox also be afraid return forest
 ‘Owl and fox returned frightened into the forest.’ (p. 267)

Nowadays *cái* is used as a classifier for inanimate objects. Therefore, we suppose that a specialization has taken place. A detailed analysis of the derivation of Vietnamese classifiers is beyond the scope of this book. Still, I assume that classifiers developed into Vietnamese in different ways: some may have derived from class terms and others by means of specialization from a general classifier.

For Grinevald (2002), “Classifiers ... are to be conceived of as an intermediate type of classification system, mid-way between more lexical and more grammatical systems ...” (p. 260) as shown in the following “grammaticalization continuum”:

<Lexical.....morphosyntactic>
 class terms “CLASSIFIERS” noun classes-gender
 measure terms (Grinevald 2002, p. 260)

Class terms are words which are used to create compounds such as “-berry” in “blueberry” and “strawberry”. Measure terms like *a glass of water* or *a pile of book* exist in all languages and

express quantity or arrangement. In numeral-classifier languages class terms are called *measural classifiers*, whereas the ‘true’ classifiers are named *sortal classifiers* (cf. Grinevald 2002, pp. 260–261).

2.5 Conclusion

In this section, the diversity of approaches to classifiers as well as the different types of classifiers were explained. It has been shown that Vietnamese is a multiple classifier language, which means that one and the same classifier-morpheme occurs in different environments. The most common Vietnamese classifiers are noun and numeral-classifiers. Other classifier types are deictic and wh-word classifiers. Classifiers in Vietnamese as well as in many other classifier languages constitute a semi-open class (cf. Dixon 1986), which means that it is not possible to state the exact number of Vietnamese classifiers. As a result, the integration of new classifiers into the language is a productive process. Nevertheless, Vietnamese classifiers are distinct from compounds and measure terms. When it comes to discontinuous noun phrases, distinguishing between classified and unclassified noun, as well as optionally classified nouns is necessary to analyse them correctly.

Chapter 3 The syntax of NP split constructions

3.1 Introduction

The syntactic analysis of split constructions is not straightforward in Vietnamese, nor is it in many other languages. The two main approaches are first, the movement analysis and second, the base-generation model. The first analysis is problematic because in this approach usually only maximal projections can move. Moving only parts of a noun phrase violates this constraint (cf. Chomsky 1986). The second analysis considers split constructions as consisting of two independent noun phrases. This view also presents some problems since it does not straightforwardly account for the fact that the two phrases are semantically connected to one another and often show agreement. However, there is also a third type of analysis, which combines movement and base-generation as in Ott (2012) and Fanselow (1988). These kinds of theories are called ‘hybrid theories’. Hybrid theories constitute a less standard approach compared to the other two approaches.

Since only very little research on the syntax of NP split constructions in Vietnamese has been done so far, I will first give an overview of the arguments for movement and base-generation in German. Vietnamese and German belong to different language families and therefore not all of the arguments for German are transferable to Vietnamese. Still, this overview will be helpful in developing a framework for Vietnamese afterwards. In this chapter, first of all an overview on the research of discontinuous noun phrases in German will be given (Section 3.2). Afterwards the syntax of discontinuous noun phrases in Vietnamese will be presented (Section 3.3). In 3.4. the conclusion of this chapter is made.

3.2 Overview of the research on discontinuous noun phrases in German

3.2.1 Evidence for movement

The first argument for movement is that there is often grammatical agreement between noun and remainder. In (1) both the noun *Bücher* ‘books’ and the quantifier *keine* ‘none’ are in the (accusative)¹ plural. In (2) noun and remainder are dative plural.

¹ In this case accusative and nominative take the same form.

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- (1) Bücher hat sie keine.
books has she none.PL²
'As for books, she does not have any.'

- (2) Freunden hat sie nur besonders engen einen Kuchen
friends.PL.DAT has she only especially close (PL DAT) a cake
gebacken.
baked
'She only baked a cake for especially close friends.' (Ott 2012, p. 35)

One of the standard arguments for movement is island sensitivity. Example (3) displays violation of the complex NP constraint, leading to ungrammaticality. According to the complex noun phrase constraint no constituent can be moved out of a complex NP (cf. Ross 1967).

- (3) *Eine Lösung kenne ich keinen, der eine bessere hat
a solution know I nobody.ACC who a better (one) has
als ich.
than I
'I know nobody who has a better solution than I.' (van Riemsdijk 1989, p. 114)

Discontinuous noun phrases occur with anaphora as can be seen from (4). In this case, the noun phrase *Bücher von einander* 'books by one another' is moved away from the quantifier *keine* 'none' leaving the trace j . Furthermore, the reciprocal *einander* is bound by the pronoun *uns* 'us'. Thus, the use of anaphora with discontinuous noun phrases can be seen as an argument for movement.³

- (4) [Bücher von einander] _{j} sind uns _{i} ; [keine e_j] bekannt.
books by one another are us.DAT none known
'As for books by each other, we don't know of any.' (van Riemsdijk 1989, p. 115)

3.2.2 Evidence for base-generation

The first argument for base-generation is inflection-mismatch. Fanselow (1988) mentions that there are split constructions that do not have an "unsplit" equivalent. The inflection of the discontinuous noun phrase in (5), for example, is different from the inflection of the continuous

² The case of noun and remainder is for both accusative. However, in this situation the nominative forms do not differ from their accusative equivalents.

³ In the next section, this argument will be questioned considering more data.

noun phrase we find in (6). Simply splitting the continuous NP “keine polnischen Gänse” apart results in ungrammaticality as in (7).

(5) Polnische Gänse gekauft hat sie keine.
Polish (strong infl.) geese bought has she no
‘She didn’t buy any Polish geese.’

(6) Sie hat keine polnischen Gänse gekauft.
she has no Polish (weak infl.) geese bought
‘She didn’t buy any Polish geese.’

(7) *Polnischen Gänse gekauft hat sie keine.
Polish (weak infl.) geese bought has she none
‘She didn’t buy any Polish geese.’ (Fanselow 1988, p. 99)

(8) Sie hat keine polnischen gekauft.
she has none Polish bought
‘She did not buy any Polish (geese).’

(9) *Sie hat keine polnische gekauft.
she has none Polish bought
‘She did not buy any Polish (geese).’⁴

In order to better understand the examples (5) to (7) it is useful to look at the general rules of German grammar.

In (8) *keine polnischen* ‘no Polish’ displays noun-like behaviour. Therefore, this inflection is also called ‘strong’ inflection. The weak inflection *keine polnische* ‘no Polish’ in (9) cannot occur without a noun agreeing in case and number.

Nolda (2007) analyses similar cases and shows that the reason why (10) is ungrammatical is that *kein* ‘none’ can only be used as a modifier. However, expressions like *keins* ‘none’ display a noun-like behaviour as in (10), which is the grammatical version of (10) (cf. also Fanselow 2013). This is also true for the ‘Polish geese’ in (5) to (7).

⁴ This sentence would be grammatical if *keine polnische* ‘no Polish’ referred back to a feminine noun in the singular.

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(10) Geld fehlt, wie gesagt, keins.
money is missing as said none
'No money is missing, like I said.'

(11) *Geld fehlt, wie gesagt, kein.
money is missing as said none
'No money is missing, like I said.'

(Nolda 2007, p. 3)

As can be seen from (12), *kein* generally cannot occur without a noun, but is grammatical when a noun follows as in (13).

(12) *Es fehlt kein.
it missing no
'No money is missing.'

(Nolda 2007, p. 41)

(13) Es fehlt kein Geld.
it missing no money
'No money is missing.'

(Nolda 2007, p. 41)

The fact that only the strong inflection of adjective and quantifier are available in discontinuous noun phrases hints that the remainder constitutes an NP ellipsis and is thus base-generated.

Whereas examples (5) and (10) may be explained by general rules of German grammar, the mismatch in (14) is more difficult to explain. In (14) the noun *Zeitungen* 'newspapers' is in the plural, whereas the remainder is the singular numeral *eine* 'one'. Again, the noun cannot be plural in its continuous version as in shown in (15), but is grammatical in its singular form as in (16).

(14) Zeitungen lese ich nur eine.
newspapers read I only one
'I only read one newspaper.'

(Fanselow 2013, p. 15)

(15) *Ich lese nur eine Zeitungen.
I read only one newspapers
'I only read one newspaper.'

(Fanselow 2013, p. 15)

(16) Ich lese nur eine Zeitung.
I read only one newspaper
'I only read one newspaper.'

(Fanselow 2013, p. 15)

The singular/plural mismatch in (14) may lead to the conclusion that the noun is a free topic and therefore does not have to agree with the numeral.⁵

The second argument for base-generation is preposition doubling in discontinuous noun phrases as in (17), whereas preposition doubling is not possible in its continuous variant as in (18).

- (17) In Schlössern habe ich noch in keinen gewohnt.
 in castles have I so far in none lived
 ‘As for castles, I haven’t lived in any so far.’ (Fanselow and Cavar 2002, p. 69)

- (18) *Ich habe noch in in keinen Schlössern gewohnt.
 I have yet in in none castles lived
 ‘I haven’t lived in any castles yet.’

The following example (19) shows that indefinite and negative quantifiers can co-occur; again this is not possible with a continuous noun phrase as in (20) and (21). Therefore, this is also an argument for base-generation.

- (19) Einen Wagen hat er sich noch keinen leisten können.
 a car had he REFL yet none afford could
 ‘As for cars, he has not been able to afford one yet.’ (van Riemsdijk 1989, p. 106)

- (20) *Keinen einen Wagen.
 none one car
 ‘no car’

- (21) *Einen keinen Wagen.
 one none car
 ‘no car’ (van Riemsdijk 1989, p. 106)

Other cases where noun and remainder cannot be connected to each other are cases of gapless splits (see Section 1.12.3). As can be seen from (22), both *Reptilien* ‘reptiles’ and *Eidechsen* ‘lizards’ are full NPs and thus do not have a continuous equivalent as in (23).

⁵ Ott (2012) discusses examples of case mismatch as in (1) where a single noun refers to two distinct remainders each taking a different case. These examples are more difficult to explain compared to the mismatch shown above. However, as indicated by the “?”, such sentences seem to be at the boundary of grammaticality in German.

(1) ?Frauen vertraut er nur blonden und küsst nur hübsche
 women.ACC/DAT trust he only blonde.DAT and kisses only pretty.ACC
 ‘As for women, he trusts only blonde ones and kisses only pretty ones.’ (p. 35)

(22) Reptilien mag sie nur Eidechsen.

reptiles like she only lizards

‘As for reptiles, she only likes lizards.’

(23) *Sie mag nur Reptilien Eidechsen.

she likes only reptiles lizards

‘As for reptiles, she only likes lizards.’

Furthermore, German articles and quantifiers may also function as “pronouns” without an overt noun accompanying them as in (24) and (25).

Fanselow (1988) also shows that German NPs may occur without an overt noun as in (24) and (25). Since German allows NP ellipsis of this type, the question arises whether the remainder of a split construction constitutes an NP ellipsis.

(24) Ich habe den noch nicht gefunden.

I have the.ACC.M yet not found

‘I haven’t found him/it yet.’

(25) Ich kenne keinen in Uppsala.

I know no.ART in Uppsala

‘I know no-one in Uppsala.’

(Fanselow 1988, p. 98)

3.3 The syntax of NP split constructions in Vietnamese

The only syntactic approach to NP split in Vietnamese which has been worked out is that of Trinh (2011), for whom split constructions in Vietnamese involve movement. However, Féry & Fanselow (2006) argue that split constructions in Vietnamese contain ‘free topics’. Féry & Fanselow (2006) do not give a detailed analysis of Vietnamese, but rather group the behaviour of Vietnamese with that of other Asian languages. In this section, I argue for the ‘free topic’ analysis and give a detailed description of the Vietnamese data that support this choice.

Féry & Fanselow (2006) assume that in Vietnamese, as well as in other Asian languages, for example Japanese as in (26), there are no discontinuous noun phrases derived by movement analysis. Since these languages are known to have ‘free topics’ anyway, these free topics may also occur in split constructions (cf. p. 64-65).

(26) tori-wa kare-wa kanaria-dake(-o) sitteru

bird-TOP he-TOP canary-only-ACC know

‘As for birds, he only knows canaries.’

(Fanselow & Féry 2006, p. 64)

3.3.1 *Trịnh (2011)*

Trịnh (2011) assumes A-bar movement of N to [Spec, C] for split constructions.

- (27) Sách thì nó sẽ mua hai quyển.
 book TOP s/he will buy two CLF
 ‘S/he will buy two books.’

Example (27) is thus analysed as shown in Figure 3.1. The noun *sách* ‘book’ A-bar moves from the β complement position to specifier CP.

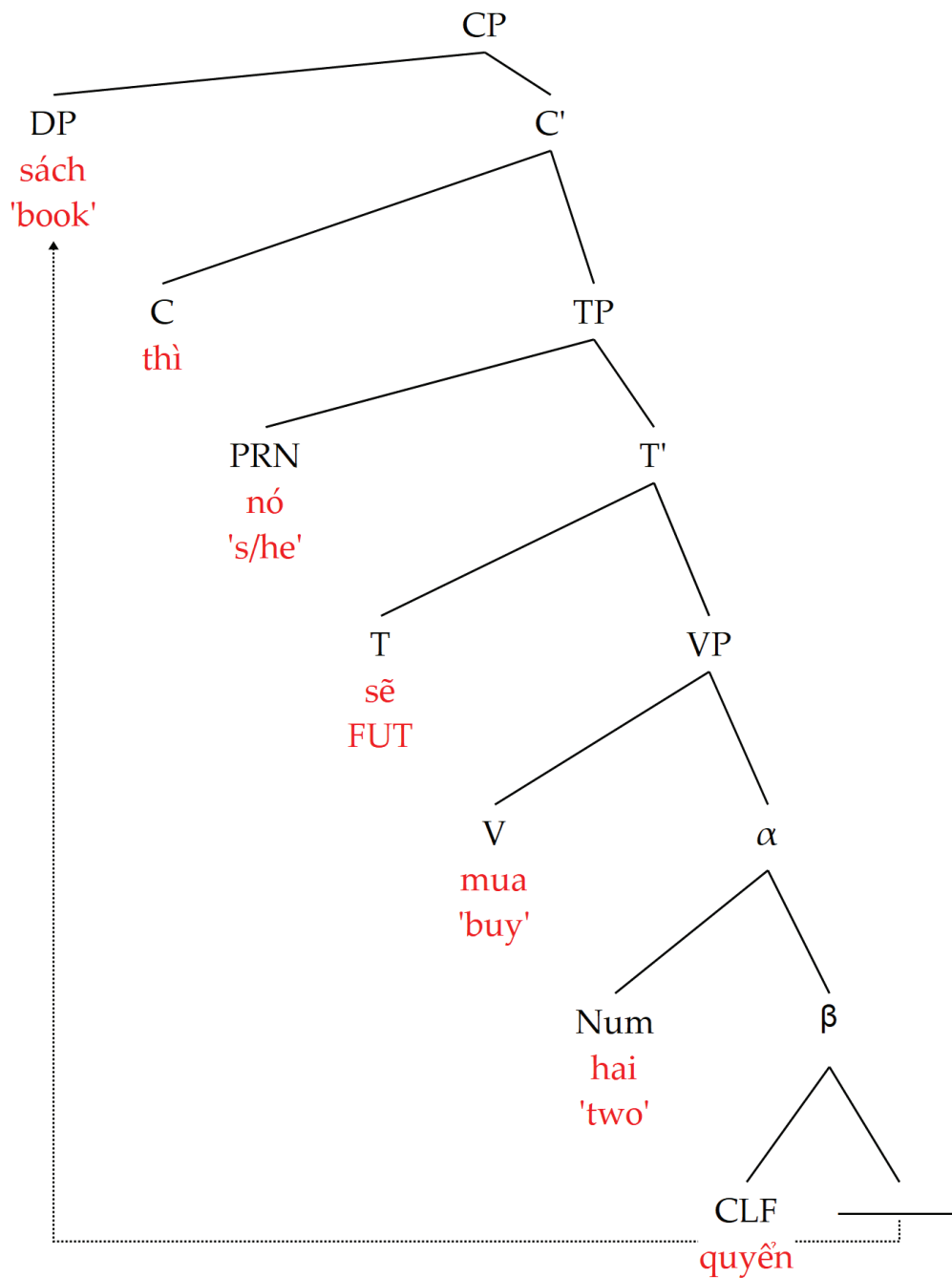


Figure 3.1 modified from Trịnh (2011), p. 78

Trịnh (2011) explains the fact that *sách* ‘book’ only occurs in the beginning of the sentence and not at the end of it (after the classifier) by assuming the so-called Edge Condition on Copy Deletion (ECCD) formulated below:

Edge Condition on Copy Deletion (ECCD)

For a chain (α, β) where α is the higher and β is the lower copy, deletion of β requires that β ends any XP (p. 18).

According to this principle *sách* ‘book’ in Figure 3.1 is deleted because it is not the head, but the complement of the XP β .

Trịnh (2011) assumes A-bar movement since the relationship between fronted noun and stranded classifier spans finite clause boundaries, but is island sensitive. In (28) we see that it is possible to separate the noun from the numeral-classifier-complex despite the finite-clause *tôi nghĩ là ...* ‘I think that ...’. Note that *là* ‘that’ is a ‘connection word’ rather than a relative pronoun since it may also be used to connect two nouns as in (30).

In (29) the noun cannot move out of the complex noun phrase island “a person who has two”.

(28) Sách thì tôi nghĩ [_{CP} là nó sẽ mua hai quyển].

book TOP I think that s/he will buy two CLF

‘When it comes to books, I think that he will buy two of them.’ (Trịnh 2011, p. 76)

(29) *Sách thì nó sẽ gặp [_{island} một người có hai quyển].

book TOP s/he will meet one person have two CLF

‘He will meet one person who has two books.’ (Trịnh 2011, p. 77)

(30) Cô là thư ký.

(younger) aunt be secretary

‘She is a secretary.’

Other types of island NP split constructions are not possible either. (31) shows that there is an adjunct island constraint, in (32) a subject island constraint is at work, and in (33) there is a non-bridge-verb island constraint. Furthermore, Trịnh (2011) assumes that a discontinuous noun phrase cannot itself be in a subject as in (34).

(31) *Sách thì nó đi về [_{island} sáu khi mua hai quyển].

book TOP s/he go home after moment buy two CLF

‘He went home after s/he bought two books.’ (Trịnh 2011, p. 77)

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(32) *Sách [island thì nó mua hai quyển] là tốt.
book TOP s/he buy two CLF be good
'That s/he buys two books is good.' (Trình 2011, p. 77)

(33) *Sách thì nó thì thào [island rằng nó sẽ mua hai quyển].
book TOP s/he whisper that s/he will buy two CLF
'He whispered that s/he would buy two books.' (Trình 2011, p. 77)

(34) *Sách [island thì nó mua hai quyển] là tốt].
book TOP s/he buy two CLF be good
'It is good that s/he buys two books.' (Trình 2011, p. 77)

According to my own investigations with native speakers, the constraints that Trinh (2011) mentions do not apply for all contexts. The contexts of (35) and (36) elicit contrastive topic and focus. The sentences are grammatical although the complex noun phrase constraint should disallow them:

(35) Context: In this village there are a lot of cats.

Mèo tôi đã gặp một người có năm con.
cat I PAST meet one person have five CLF
'As for cats, I met a person who has five.'

(36) Context: There are many ducks and chickens sold at the market.

Vịt tôi thấy một người bán năm con còn gà thì thấy một
duck I see one person sell five CLF and chicken TOP see one
người bán bốn con.
person sell four CLF
'As for ducks, I see/saw a person selling five and as for chickens, I saw a person selling four.'

(37) should not be allowed because of the non-bridging-verb island constraint, still it is possible when the discontinuous noun phrase is in a contrastive topic/focus relationship. Furthermore, in (37) the main clauses contain the verb phrase *thì thào* 'whisper' and the verb phrase *công khai* 'state publically' - these phrases again constitute a contrast.

- (37) Sách thì nó **thì thào** là nó sẽ mua hai quyển còn viết
 book TOP s/he whisper that s/he will buy two CLF and write
 thì nó **công khai** là nó sẽ mua 10 cây.
 TOP s/he state publicly that s/he will buy 10 CLF

‘He whispered that he will buy two books and stated publicly that he will buy 10 pens.’

Additionally, the subject constraint does not seem to be active if the particle *rồi* ‘already’ is added after the adjective as in (38).

- (38) Sách thì nó mua hai quyển là tốt **rồi**.
 book TOP s/he buy two CLF/ be good already

‘It is good that he buys two books.’

Moreover, the adjunct constraint may be overruled if a context for contrastive topic and focus is created as in (39). Comparable to (37) the verb phrases of the main clauses *đi về* ‘go home’ and *tiếp tục mua* ‘continue buying’ constitute a contrast.

- (39) Sách thì nó **đi về** sau khi mua hai quyển, còn viết
 book TOP s/he go home after buy two CLF and pen
 thì nó **tiếp tục mua** sau khi đã mua 10 cây.
 TOP he continue buy after already buy 10 CLF

‘As for books, he went home after buying two ones and as for pens he continued buying them after having bought 10 ones.’

The reason why there is a discrepancy between my data and Trịnh’s constraints may be due to the fact that there is no distinction between discontinuous noun phrases and free topics in Vietnamese. There is no Vietnamese equivalent of ‘as for’ in English as in the following example:

- (40) Giày (thì) tôi thích màu đỏ.
 shoe(s) (TOP) I like colour red

‘As for shoes, I like red ones.’

In Vietnamese, the topic marker *thì* may be used to indicate a free topic, but it is not obligatory. As a result, an ambiguity is unavoidable between discontinuous noun phrases and free topics. German, by contrast, can make a clear distinction between both types: (41) contains a free topic and (42) a discontinuous noun phrase. These examples from German show that there is a structural difference between free topics and discontinuous noun phrases. The lack of a

structural distinction between discontinuous noun phrases and free topics in Vietnamese leads to two different interpretations. The first interpretation is that Vietnamese does not have discontinuous noun phrases in a strict sense, but that split constructions actually involve free topics (see also Fanselow & Féry 2006). Another interpretation is that there is an underlying distinction between discontinuous noun phrases and free topics that is not visible on the surface.

(41) Was Bücher angeht, habe ich nur rote.
what books is about have I only red
'Concerning books, I only have red ones.'

(42) Bücher habe ich nur rote.
books have I only red
'I have only red books.'

The similarity between free topics and split constructions was noted earlier:

While such constructions [free topics] do not involve any syntactic displacement, they are virtually equivalent to STCs [split topics] in their pragmatic force (as also observed in Haider 1985: 237, Oppenrieder 1991: 72, Pittner 1995: 33, and Shaer et al. 2009: 4). (Ott 2012, p. 82)

In other words, Ott (2012) observes that split constructions may occur in the same pragmatic contexts as free topics. The only difference is that split constructions involve syntactic movement, whereas free topics do not.

3.3.2 A base-generation account of Vietnamese split constructions

As has been seen from Section 3.2.1, the movement analysis of Vietnamese discontinuous noun phrases is not a promising one since island sensitivity as assumed by Trinh (2011) does not hold. This section provides evidence for base-generation. The first argument for base-generation is concerned with stranding of numeral-classifier-complexes as well as of the quantifiers *nhiều* 'a lot' and *ít* 'few'. The second argument is that discontinuous noun phrases occur in the form of gapless splits. The third argument is that some discontinuous noun phrases involve compounds that, like gapless splits, do not have a continuous variant.

Vietnamese classifiers function as pronouns as shown in example (9) of Chapter 2, repeated in (43) below:

(43) Bán cho tôi **hai con**. (Lê 2008, p. 21)

sell for I two CLF (+ animate)

‘Sell me two ones.’

As already mentioned, (43) could be uttered where somebody wants to buy two chickens at the market. However, it may also occur when the context is about knives.⁶

(44) is another example of the use of a classifier as a pronoun.

(44) Context: There is a special offer on baskets this week, so everybody wants to buy them.

Thảo mua **bốn cái**, Lý **ba cái** còn Mai thì **sáu cái**.

Thao buy four CLF Ly three CLF and Mai TOP six CLF

‘Thao buys four, Ly buys three and May buys six.’

In (45) the classifier is connected to the adjective *đỏ* ‘red’ and again functions as a pronoun.

(45) Tôi mua **cái đỏ**.

I buy CLF red

‘I buy the red one.’

Remember that also demonstrative-classifier complexes may occur as pronouns as in example (27) of Chapter 2, repeated in (46).

(46) A: Anh muốn cuốn sách nào?

older brother want CLF book which

B: **Cuốn kia**.

CLF that

‘A: Which book do you want? B: That one.’ (Aikhenvald 2000, p. 211)

In (47) and (48) the quantifiers *ít* ‘few’ and *nhiều* ‘a lot’ are stranded without a head noun and classifier. The two sentences may be uttered when the context is about how much of a specific object/how many objects were bought. Note that the quantifiers *ít* ‘few’ and *nhiều* ‘a lot’ may also occur without a classifier being connected to them in discontinuous noun phrases, as shown in example (53) of Chapter 1, repeated in (49) below.

⁶ Although the use of the classifier *cái* as a pronoun for *dao* ‘knife’ seems to be more intuitive, the use of the classifier *con* is also possible (Thuan Trần, personal communication).

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(47) Tôi mua **ít** thôi.

I buy few only

‘I only bought a few.’

(48) Tôi mua **nhều**.

I buy a lot

‘I buy a lot.’

(49) Context: Dung buys bananas and apples.

Chuối mua nhều nhưng táo thì mua ít.

banana buy many but apple TOP buy few

‘He buys many bananas, but few apples.’

As shown before, German articles and quantifiers may also function as pronouns, similarly to Vietnamese classifiers (see Section 3.2.2, p. 64).

Furthermore, we find gapless splits (see Section 1.12.3) that are problematic for the movement analysis in that they contain two full NPs instead of two parts of the same NP. (22) repeated in (50) is an example for a gapless split in German, while (51) (repetition of (65), Chapter 1) and (52) show gapless splits in Vietnamese. None of these examples has a continuous equivalent.

(50) Reptilien mag sie nur Eidechsen.

reptiles like she only lizard

‘As for reptiles, she only likes lizards.’

(51) Context: A: What kind of foreign cars do you like?

B: Xe hơi nhật thì anh thích Toyota còn xe hơi Đức

car Japanese TOP here: I like Toyota and car German

thì thích Volkswagen.

TOP like Volkswagen

‘As for Japanese cars, I like Toyota and as for German cars I like Volkswagen.’

(52) Context: A: I like to eat bananas and how about you?

B: Trái cây thì thích ăn trái cam.

fruit TOP like eat CLF orange

‘As for fruits, I like oranges.’

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Just like gapless splits, discontinuous noun phrases involving compounds also do not show a continuous equivalent. Example (58) of Chapter 2, which is repeated in (53), shows an example of a discontinuous noun phrase involving the compound *tàu bè* ‘(literally) boat and raft’.

- (53) Tàu bè, ông A có mười chiếc.
boat raft grandfather A have ten CLF
‘As for boats, Mr. A has ten of them.’ (P. P. Nguyễn 2002, p. 35)

However, the classifier cannot occur directly before the compound as in (61), Chapter 2, which is repeated in (54). We can thus conclude that a base-generation analysis is appropriate to analyse this data point.

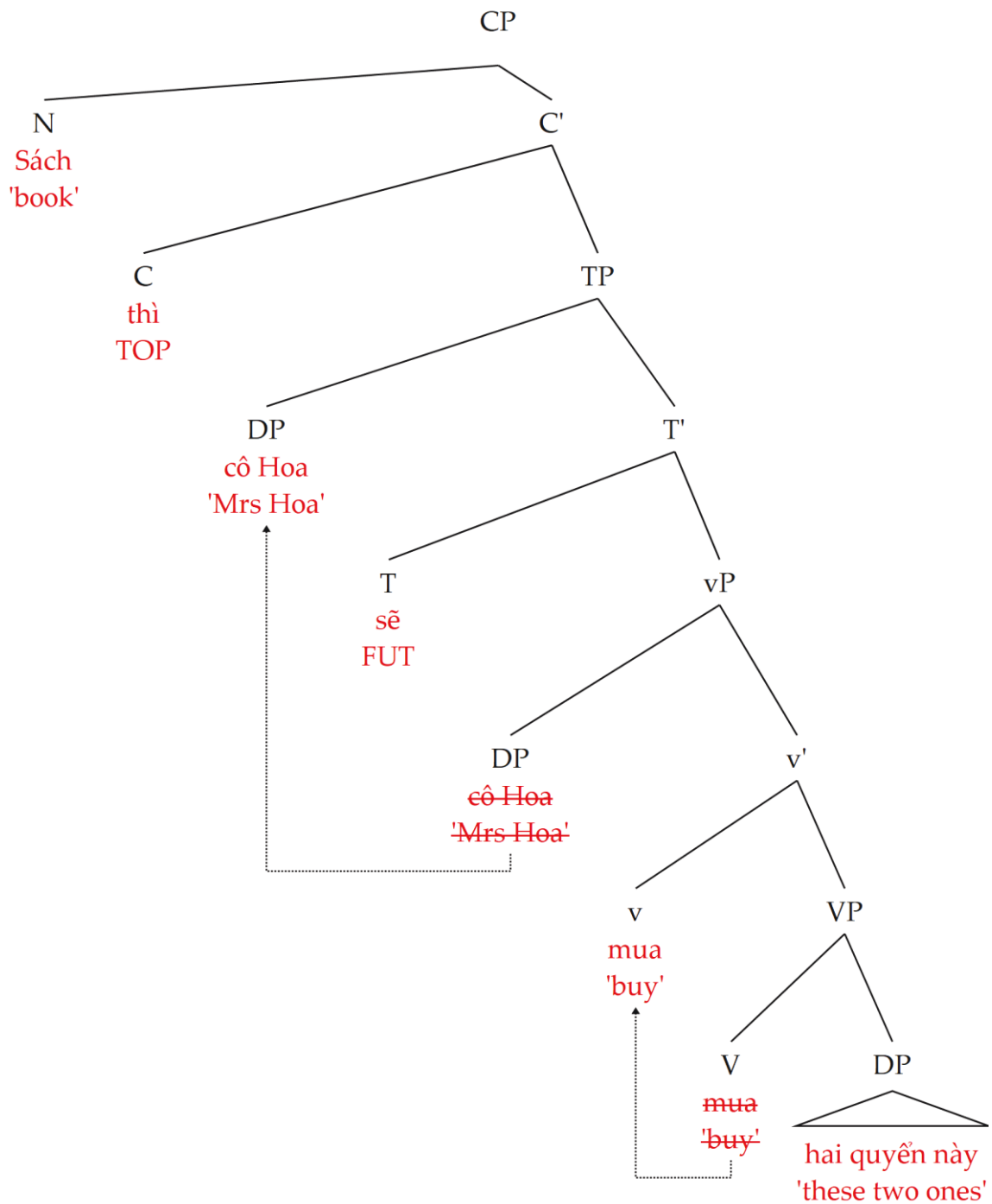
- (54) *chiếc tàu bè
CLF boat raft
‘boat’ (P. P. Nguyễn 2002, p. 35)

I assume that discontinuous noun phrases in Vietnamese do not really involve *discontinuous* noun phrases in a strict sense, but rather noun and remnant are two separate constituents. The remnant can either be a noun, as in gapless splits, or functions as a pronoun, as in all other cases of discontinuous noun phrases. (56) shows the syntactic tree of the sentence in (55).⁷ Note that *cô* ‘younger aunt’ in (56) is analysed as the title of the person rather than as a classifier. The first part of the discontinuous noun phrase is an NP rather than just a noun because it can be modified, for example *xe hơi nhật* ‘Japanese car(s)’ in (51).

As can be seen from the tree, Vietnamese is a head-initial language (see also Simpson 2005, T. Trần 2009, Trịnh 2011). However, as was shown in Section 1.5, example (11), Vietnamese demonstratives occur at the end of a noun phrase. This is problematic if we assume that Vietnamese noun phrases are part of a DP since we would expect the head to occur initially. A possible way of explaining this word order is to assume movement of the noun from the DP’s complement position to its specifier (Simpson 2005). However, discussing this possible analysis is beyond the scope of this book.

- (55) Sách thì cô Hoa sẽ mua hai quyển này.
book TOP younger aunt Hoa FUT buy two CLF this
‘Mrs. Hoa will buy two books.’

⁷ For reasons of space not all bare-projections are shown.

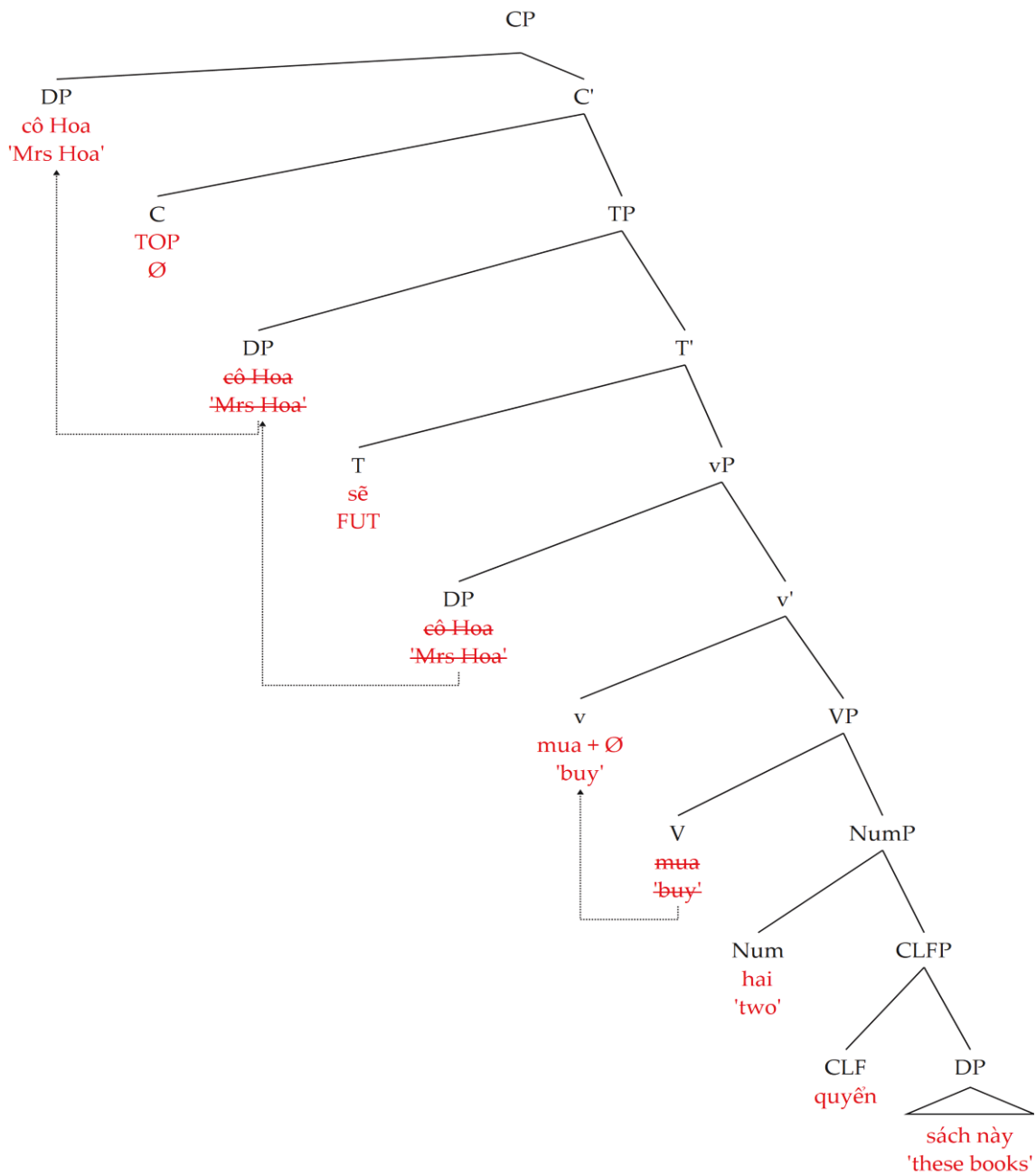


(56)

I follow Fanselow (1988) and Ott (2012) in assuming that the different parts of a discontinuous noun phrase are connected to each other by the fact that they share the same θ -role. In (55), for example, noun phrase and remnant both refer to the theme of the VP. Furthermore, the noun phrase constitutes an open expression, whereas the remnant constitutes a closed expression (cf. Fanselow 1988, Ott 2012; see also Chung & Ladusaw 2001).

(58) shows the syntactic structure of the continuous sentence in (57). In this case, both the numeral and the classifier form their own phrase. The numeral phrase (NUMP) *hai* ‘two’ merges with the classifier phrase (CLFP) *quyển* ‘CLF’, then the CLFP merges with the DP *sách này* ‘this book’.

(57) Cô Hoa sẽ mua hai quyển sách này.
 younger aunt Hoa will buy two CLF book this
 ‘Mrs. Hoa will buy two books.’



(58)

This section has shown that the base-generation approach accounts for the Vietnamese data in a straightforward way. Vietnamese split constructions are not island sensitive and they may occur in the form of gapless splits. Numeral-classifier complexes occur outside of split constructions, where the classifier functions as a pronoun.

The connection between classifier complex and remainder is based on a semantic and information-structural relationship.⁸

3.3.3 Possible counter arguments and their criticism

An argument for movement is discontinuous noun phrases involving anaphoric expressions as described by van Riemsdijk (1989) (see Section 3.2.1). Consider example (4) which is repeated in (59)

- (59) [Bücher von einander]_i sind uns;_i [keine e_j] bekannt.
 books by one another are (to) us none known
 ‘As for books by each other, we don’t know of any.’ (van Riemsdijk 1989, p. 115)

In Vietnamese discontinuous noun phrases involving anaphoric expressions are also found:

- (60) [Sách về minh]_i thì chê [hai quyển e_i] còn [sách về
 book about REFL TOP criticize two CLF and book about
người khách]_j thì khen [ba quyển e_j].
 people other TOP praise three CLF
 ‘S/he criticized two books about him/herself and praised three books about other people.’

In both examples ((59) and (60)) anaphoric expressions are part of a complex noun phrase: In (59) the reciprocal *einander* ‘one another’ is part of the complex noun phrase *keine Bücher von einander* ‘no books by one another’ and in (60) the reflexive *minh* is part of the complex noun phrase *hai quyển sách về mình* ‘two books about each other’. The anaphoric expressions and the head noun are separated from the quantifier *keine* ‘no’ in (59) and from the numeral classifier complex *hai quyển* ‘two CLF’ in (60). The most straightforward analysis for these separations is movement.

⁸ In Duong Phu (2017), I assumed that a ‘hybrid theory’, a mixture between movement and base-generation as proposed by Ott (2012) and Fanselow (1988), was an appropriate analysis of split constructions in Vietnamese. However, an in-depth analysis of the data has revealed that base-generation is more convincing.

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However, not all authors agree that anaphoric expressions necessarily involve movement. Many authors have argued that this is not always the case for English. Ross (1970) notes that with *emphatic reflexives* there is no coreferential NP in the same simplex sentence as in (61).

(61) Tom believed that the paper had been written by Ann and himself. (Ross 1970, p. 227)

Jackendoff (1972) observes that with “picture of” phrases + reflexives, antecedent and anaphor do not need to be in a c-commanding relationship as shown in (62).

(62) The fact that there is a picture of himself_i hanging in the post office is believed
(by Mary) to be disturbing Tom_i. (Jackendoff 1972, p. 137)

Pollard & Sag (1992) show other constructions of this type as in (63).

(63) The agreement that [Iran and Iraq]_i reached guaranteed each other_i's trading rights in the
disputed waters until the year 2010. (Pollard & Sag 1992, p. 4)

Reinhard & Reuland (1993) show an example where the English reflexive “myself” occurs although there is no antecedent in the same sentence.

(64) They were five tourists in the room apart from myself.
(Reinhard & Reuland 1993, p. 669)

Zribi-Hertz (1989) finds reflexives without antecedence in the same sentence in a corpus study from English literature as in (65)

(65) This is a big thing, Martin, something bigger than ourselves.
(Murdoch 1972 quoted in Zribi-Hertz 1989)

These examples from English show that the use of reflexives within discontinuous noun phrases is by no means proof that movement has taken place. By analogy, the Vietnamese reflexive in (60) might also be analysed as an emphatic reflexive.

A potential argument for movement is agreement between classifier and noun. A similar argument has been made for German, where we find grammatical agreement between noun and remainder, as was shown in Section 3.2.1. Classifier and target noun are mostly semantically connected to each other; therefore, the agreement is semantic. However, when there is no clear semantic connection between classifier and target noun, the agreement is morphological.

In (66) the classifier *quyển* ‘CLF (bound objects)’ is the correct classifier for ‘book’ whereas *con* ‘CLF’ (+animated)’ in (67) is not correct.

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- (66) Sách tôi mua hai quyển.
book I buy two CLF (bound objects)
'I buy two books.'
- (67) *Sách tôi mua hai con.
book I buy two CLF (+animated)
'I buy two books.'
- (68) Muỗng thì mua bốn cái còn dao thì năm con.
spoon TOP buy four CLF and knife TOP five CLF
'S/he buys four spoons and five knives.'
- (69) *Muỗng thì mua bốn cây còn dao thì năm cây.
spoon TOP buy four CLF and knife TOP five CLF
'S/he buys four spoons and five knives.'

In (68) *muỗng* 'spoon' takes the classifier *cái* for inanimate objects. *Dao* 'knife' takes the classifier *con*. This classifier is usually a classifier for animate things or beings, however, it also occurs with other objects that can be perceived as moveable, like 'knife' and 'street' (cf. Löbel 1996, p. 138-139, see also Section 2.3). Since this usage of the classifier *con* may be considered as counter-intuitive from a synchronic point of view, we might argue that the agreement between remainder and target noun is morphological and not semantic.

Another possible classifier for *dao* 'knife' is *cái*, the classifier for inanimate objects (see Section 2.3). The sentence in (68) is ungrammatical if an inappropriate classifier is used such as the classifier *cây* (classifier for long objects) like in (69).

However, as mentioned in Section 3.3.2, in examples like (43), repeated in (70), *con* 'CLF' may refer back to *knives* if *knives* are inferable from the context. Therefore, an analysis involving morphological agreement between the noun and classifier *con* is not tenable.

- (70) Bán cho tôi hai con. (Lê 2008, p. 21)
sell for I two CLF (+animate)
'Sell me two ones.'

Furthermore, not all discontinuous noun phrases in Vietnamese involve classifiers. In (71) the quantifiers *nhều* 'many/a lot' and *ít* 'few' occur without a classifier, whereas in (72) the classifier occurs with the quantifier. The sentence in (71) is more acceptable than the sentence

in (72). In fact an informant mentioned that (72) is acceptable, but less natural than (71). Another speaker rejected (72) and a third speaker accepted it.

(71) Context: Dung buys bananas and apples.

Chuối mua nhiều nhưng táo thì mua ít.
banana buy many but apple TOP buy few
'He buys many bananas, but few apples.'

(72) Context: Dung buys bananas and apples.

?Chuối mua nhiều trái nhưng táo thì mua ít trái.
banana buy many CLF but apple TOP buy few CLF
'He buys many bananas, but few apples.'

For examples like (71) it is difficult to argue for an agreement analysis, unless a zero-classifier is assumed.

To conclude these two sub-sections on possible counter-examples to the base-generation approach, it turns out that none of them is able to contradict the base-generation analysis for Vietnamese.

3.4 Conclusion

In this chapter, I have presented a base-generation analysis of discontinuous noun phrases in Vietnamese. This analysis relies on the fact that numeral-classifier complexes, as well as the quantifiers *nhiều* 'a lot' and *ít* 'few', may be stranded. Furthermore, some types of discontinuous noun phrases, namely gapless splits and certain types of compounds, do not possess continuous versions. The island constraints presented by Trịnh (2011) do not hold upon a more in-depth analysis of his data. Furthermore, discontinuous noun phrases involving anaphoric expressions are by no means proof that movement has taken place. As for classifiers, the context may determine the correct choice of classifier. Therefore, there is no morphological agreement between the two parts of a discontinuous noun phrase.

Chapter 4 Vietnamese tones, intonation and prosodic structure

In this chapter, the most relevant studies on the prosodic and tonal structure of Vietnamese are summed up. This is done because both prosodic and tonal structure play an important role in the analysis of discontinuous noun phrases in Vietnamese. Regarding the prosodic structure, the prosodic phrase is especially important for my experiments in Chapter 5. As for the tones, the level (*ngang*), rising (*sắc*) and falling (*huyền*) tone play a major role. I concentrate on aspects of Vietnamese intonation that are relevant for this research: prosodic structure, tonal assimilation and anticipation, and behaviour of tones in reduplication.

As shown in this chapter, the F0 contour of Vietnamese tones in isolation is relatively clear. Therefore, most of the differences in the individual tone descriptions are made with regard to details. Little research has been done on the prosodic hierarchy in Vietnamese. According to the very controversial research by Schiering et al. (2010), there is no prosodic word in Vietnamese. This study has been contradicted by Phạm (2008). As far as I know, there is no study analysing all constituents of the prosodic hierarchy in a consistent way. There are rather small studies, which can be taken as evidence for a certain prosodic unit. As far as intonation and effects of tonal coarticulation are concerned, both of them were found. However, not so much is known about when exactly they occur.

This chapter is structured in the following way: First, I introduce Vietnamese tones (Section 4.1). Second, I introduce the prosodic hierarchy and make a proposal for how it is represented in Vietnamese (Section 4.2). Third, other research involving the prosodic hierarchy is presented (Section 4.3). Fourth, earlier studies on Vietnamese intonation are discussed (Section 4.4). Finally, this chapter will be concluded (Section 4.5).

4.1 Vietnamese tones

Vietnamese is a tone language with 6 tones in the Northern dialect and 5 tones in the Southern dialect. The Northern dialect is seen as the prestigious variety. In Figure 4.1 the average F0 contours of Northern and Southern speakers of Vietnamese are shown. As can be seen from the diagram on the right-hand-side, the broken (*ngã*) and the curve (*hỏi*) tones are realized as one tone in the Southern dialect, whereas they constitute two distinct tones in the Northern dialect.

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Furthermore, the dropping (*nặng*) and broken (*ngã*) tones are characterized not only by their specific F0 variation, but also by glottalization. In the Southern dialect glottalization is not a distinctive feature (cf. Đỗ et al. 1998, Brunelle 2009, Brunelle 2016, Vũ 1981). Still, some authors mention that glottalization may occur in the Southern dialect, but only in certain situations. However, glottalization in the Southern dialect does not have a meaning-distinguishing function (Kirby 2010, Phạm personal communication). My experiment on the Southern dialect shows that glottalization is often found in the Southern dialect (Section 5.4.4.1). However, its actual function is not clear yet.

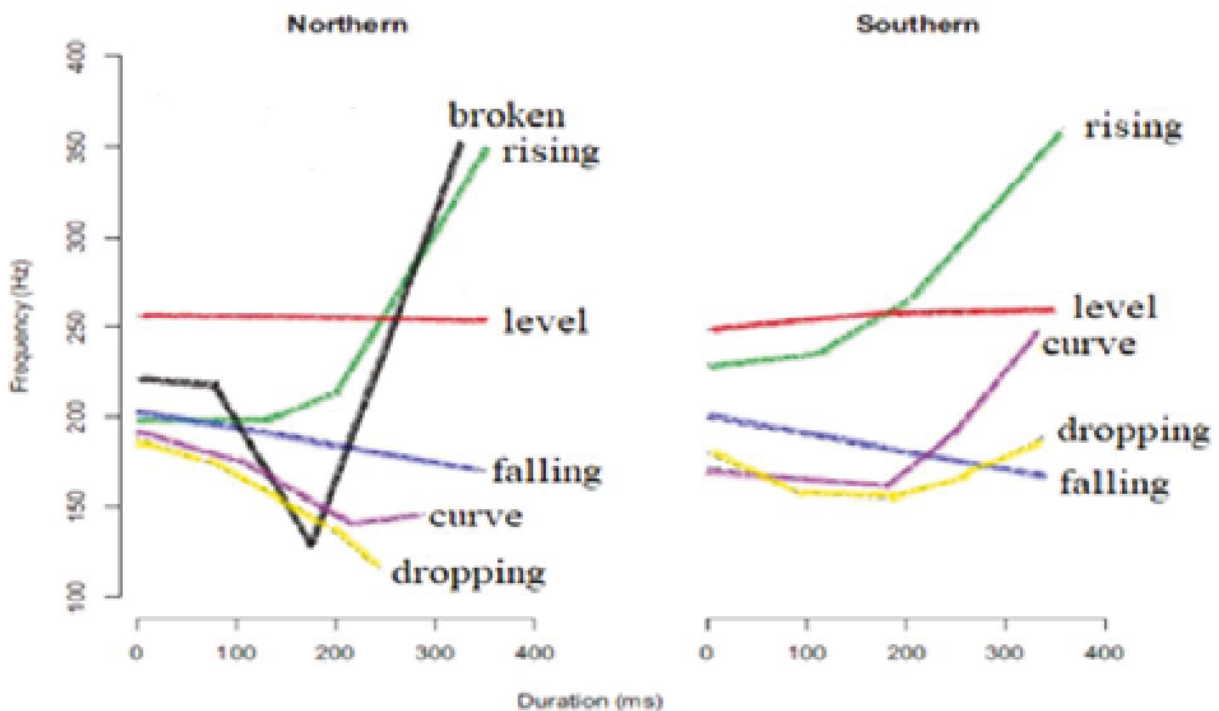


Figure 4.1 F0 contour of Vietnamese tones in the Northern and Southern dialect, from Kirby (2010) modified, originally from Hoàng (1986/1989); nomenclature of tones taken from Brunelle, Hà & Grice (2016)¹

While the graphic above is self-explanatory in showing the different F0 excursions of the tones, the detailed descriptions of the individual tones may vary according to the author. Furthermore, there is no standard way of naming Vietnamese tones. Table 4.1 shows three of the main possibilities: tone descriptions, numbers + letters and traditional nomenclature. – These three ways of naming Vietnamese tones will be described in some detail.

¹ Note that I modified the term ‘drop’ into ‘dropping’ in order to be consistent with the terms ‘falling’ and ‘rising’ tone.

Tone descriptions	level	falling	rising	drop	curve	broken
Numbers + letters	A1	A2	B1	B2	C1	C2
Traditional nomenclature	ngang	huyền	sắc	nặng	hỏi	ngã

Table 4.1 Different nomenclatures of Vietnamese tones

A very common way of referring to Vietnamese tones is to use the traditional Vietnamese terminology (*ngang*, *huyền*, *sắc*, *nặng*, *hỏi* and *ngã*). However, for non-Vietnamese speakers these traditional labels are less intuitive and difficult to memorize. Therefore, some authors additionally use more abstract symbols in order to refer to the individual tones.

Kirby (2010), for example, uses a combination of letters and numbers to refer to Vietnamese tones: A1=*ngang*, A2=*huyền*, B1=*sắc*, B2=*nặng*, C1=*hỏi*, C2=*ngã*. The same system is also used by other authors: Brunelle (2009) and Hà (2012) for example. Historical reasons lead to the use of letters and numbers. The letters demonstrate one original tone, which then developed into two different varieties of it. This is shown by the different numbers (cf. Michaud 2004). The combination of letters and numbers described above is also quite complex and difficult to remember from an outsider's perspective. Furthermore, this nomenclature is not directly related to the tone's properties of modern Vietnamese.

Using tone descriptions to name Vietnamese tones may be an easier way of referring to them. However, as will be shown when describing the individual tones, not all the tones always display the same properties in all of the dialects. Therefore, the labels of the tones only roughly correspond to the properties of the tones and not exactly. One system of describing Vietnamese tones, is done by Brunelle, Hà & Grice (2016)². The authors use the following labels for the six Vietnamese tone: level (*ngang*), falling (*huyền*), rising (*sắc*), drop (in this book *dropping*,

² Another system of tone description is shown in (Brunelle 2016).

nặng), curve (*hỏi*) tones. In this book, tone descriptions are used, in addition to the traditional names. In this way, I hope to facilitate the understanding of Vietnamese tones.

It is also worth noting that while the Northern dialect has been studied in some detail, the Southern dialect has not received much attention so far. According to Kirby (2010) this is

in part due to the fact that Ho-Chi-Minh City has seen a large influx of immigrants from other dialect regions since the 1940s, making it difficult to find “pure” [Southern Vietnamese] speakers. (p. 3750)

In the following, I provide a detailed description of Vietnamese tones:

The level tone (*ngang*) slightly falls at the end, and is described as a mid tone (Vũ 1981). Thompson (1965) categorizes the level tone (*ngang*) in the Northern dialect as “mid or high trailing pitch, nearly level when the syllable is not final in pause group [prosodic phrase]; in final syllables pitch falls to low range ...” (p. 16). In the Southern dialect the level tone (*ngang*) is described as only level. In the case of emphasis the level tone (*ngang*) starts slightly higher and then goes back to level. At the end of a pause group, in our terminology roughly a prosodic phrase, the level tone (*ngang*) falls. There seems to be no fundamental difference between the Northern and the Southern dialect in the realization of this tone (cf. Vũ 1981, p. 64).

The falling tone (*huyền*) receives breathy-voice with speakers having a low F0 range. It has a long duration and no characteristic laryngealization (Vũ 1981, p. 60). For Thompson (1987) it is “often accompanied by breathy voice quality” (p. 16).

Thompson (1987) remarks that the rising tone (*sắc*) may be nearly level in fast speech (p. 16). According to Vũ (1981) there are two kinds of the rising tone (*sắc*). One type ends with a plosive and the other one does not. Those tones ending in a plosive are referred to as checked tones in this book and those not ending in a plosive are unchecked tones. As for the rising tone, the unchecked tone begins at level tone for about one third of the time, then it starts to rise, reaching its peak at the end. It has a long duration, but no characteristic laryngealization. The checked tone starts higher and rises more sharply than the unchecked one. Its duration is only 3/5 of the unchecked variant (cf. Vũ 1981, p. 60). It is not clear whether the two forms of the rising tone (*sắc*), as well as the two forms of the dropping tone (*nặng*), are allotones, i.e. variants of the same tone, or whether they constitute two distinct tones. A. H. Phạm (2003) proposes

that (Northern) Vietnamese has eight tones (including two versions of the rising tone (*sắ́c*) and the dropping tone (*nắ́ng*)). Her main argument for this proposal is the different behaviours of the two forms of rising (*sắ́c*) and dropping (*nắ́ng*) tones with regard to reduplications (p. 45). The checked versions of the rising tone (*sắ́c*) and the dropping tone (*nắ́ng*) will not be central to this book, therefore these particularities will not be considered further.

The dropping tone (*nắ́ng*) may also appear in two forms. According to Vũ (1981), unchecked dropping tone (*nắ́ng*) in the Northern dialect is a falling tone starting and ending higher than the falling tone (*huyề̀n*). It is furthermore characterized by heavy glottalization. It takes about 4/5 of the duration of the falling tone (*huyề̀n*) (cf. Vũ 1981, p. 60). As for the Southern dialect, the dropping tone (*nắ́ng*) is a concave tone “starting at low F0, reaching lowest F0 at about 1/3 of [the] duration, then rising gently back to onset level” (Vũ 1981, p. 63). It has long duration, but no characteristic laryngealization. However, breathy voice may be found with speakers using a low F0 range. Nevertheless, Vũ (1981) mentions that in Đà Nẵng creaky voice is often heard at the end. According to Vũ’s dialectal map (p. 9), Đà Nẵng is part of the Southern dialect, even though it is located near the border of the Central dialect.³

The checked dropping tone (*nắ́ng*) in the Northern dialect is similar to the unchecked version, except for the shorter duration the dropping tone (*nắ́ng*) (3/4 of the checked version) (cf. Vũ 1981, p. 60). In the Southern dialect, the checked dropping tone (*nắ́ng*) is also shorter than the unchecked version (3/5 of the unchecked version). A further difference from the unchecked version is that it starts higher and rises at the end. However, this feature is “negligible” (Vũ 1981, p. 63).

For Thompson (1965), the dropping tone (*nắ́ng*) in the Northern dialect has a “low dropping pitch, abruptly falling to bottom of normal pitch range” (p. 16). The idea of abruptness seems to be slightly different from the description we found in Vũ (1981), who only speaks of a shorter duration (see above). At the end, the tone is either checked by a plosive or “cut off abruptly by a glottal stop” (p. 16). Thompson (1965) describes the dropping tone (*nắ́ng*) in the Southern dialect as a low tone that is level when the syllable ends with a plosive. With other syllable endings it “dips” slightly and then rises again (p. 92).

³ The Central dialect is a dialect spoken in central Vietnam, it is closely related to the Southern dialect, but displays a smaller pitch range. This dialect is not analysed further in this book.

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In the Northern dialect, the curve tone (*hỏi*) is a concave tone “starting low and falling to lowest F0 range at about 2/3 of duration, then rising toward the end (this rise varies according to speakers and phonetic environments)” (Vũ 1981, p. 60-61). The duration is long, but no characteristic laryngealization is found. However, breathy voice may occur with low F0 range (cf. Vũ 1981, p. 61). According to Thompson (1965), the curve tone (*hỏi*) in the Northern dialect has a mid-low dropping pitch which is less abrupt than the dropping tone (*nặng*), and it rises at the end in citation form (p. 16). In the Southern dialect, the curve tone (*hỏi*) begins low and then rises, sometimes as high as the rising tone (*sắc*) (p. 92).

The broken tone (*ngã*) is a concave tone “starting from mid F0 range, falling sharply to lowest F0 at about 1/3 of duration, then rising sharply again, reaching near top F0 range” (Vũ 1981, p. 61). It has a long duration and glottalization in the middle of the syllable (cf. Vũ 1981, p. 61). For Thompson (1987) the broken tone (*ngã*) has a “high rising pitch, accompanied by glottal stop or ‘strangulated’ vowel quality” (p. 16). As mentioned before, the broken tone (*ngã*) does not exist in the Southern dialect, but fuses with the curve tone (*hỏi*).

4.2 Prosodic hierarchy in Vietnamese

4.2.1 Introduction

The main idea of the prosodic hierarchy is that prosodic units are represented in a hierarchical order and not in a linear pattern (cf. Nespor & Vogel 1986, p. 7). Table 4.2 shows a standard version of the prosodic hierarchy. The utterance is the highest prosodic constituent, corresponding to “a paragraph or more”. Below the utterance, we find the intonation phrase, which corresponds “to a clause”. Further down the hierarchy the prosodic phrase is shown, corresponding to “a syntactic phrase”. Below the prosodic phrase, the prosodic word is found, which corresponds to “a grammatical word”. Below the prosodic word the foot occurs. The foot is a metrical unit, for example a trochee or iamb. Further down the hierarchy is situated the syllable, which is a string of segments, for example CV or CVC. The smallest element in the hierarchy is the mora, a unit of syllable weight.

Prosodic hierarchy

Symbol/abbreviation	Full term	Explanation
υ	utterance	roughly a paragraph or more
ι-phrase	intonation phrase	roughly a clause
Φ-phrase	prosodic phrase	roughly a syntactic phrase
ω-word	prosodic word	roughly a grammatical word
F	Foot	Metrical unit
σ	syllable	strings of segments
μ	Mora	unit of syllable weight

Table 4.2 Overview of the prosodic hierarchy, modified from Féry 2017, p. 36

The prosodic hierarchy is often associated with the first two principles of the strict layer hypothesis, as shown below:

Principle 1. A given nonterminal unit of the prosodic hierarchy, X^p , is composed of one or more units of the immediately lower category, X^{p-1} .

Principle 2. A unit of a given level of the hierarchy is exhaustively contained in the superordinate unit of which it is a part. (Nespor & Vogel 1986, p. 7)

According to the first principle, no level of the prosodic hierarchy is skipped. Furthermore, higher levels of the prosodic hierarchy exhaustively contain the immediately lower category.

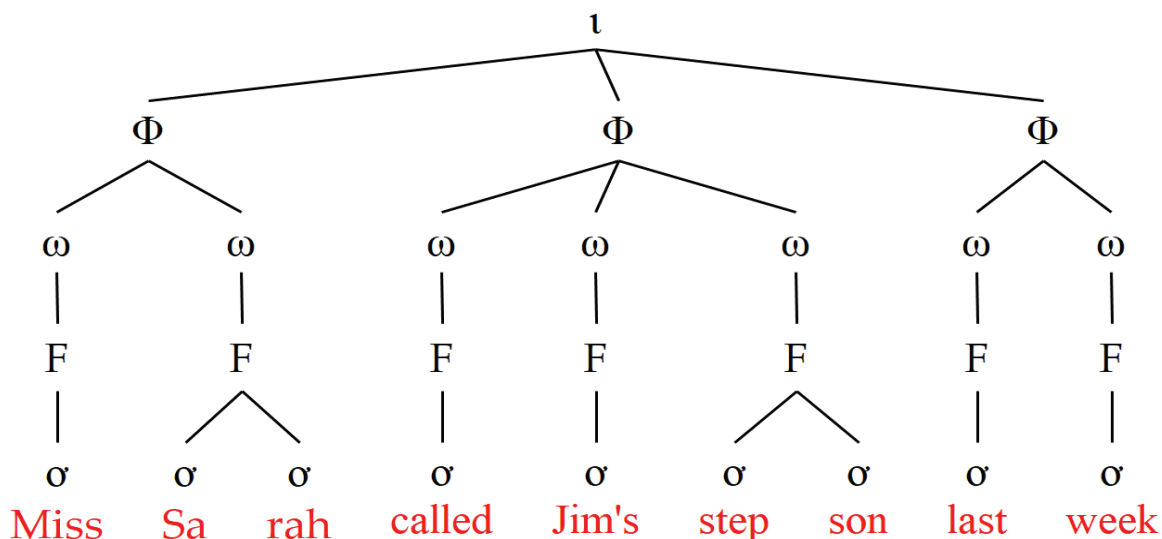


Figure 4.2 Example for the prosodic hierarchy from English, from Féry 2017, p. 38

Figure 4.2 shows how the sentence *Miss Sarah called Jim's step son last week* is structured prosodically in accordance with the strict layer hypothesis: all syllables are contained by a foot, all feet are contained by a prosodic word, and all prosodic words are contained by a prosodic phrase, and all prosodic phrases are contained by the intonation phrase.

While the strict layer hypothesis was the dominant assumption made by phonologists for decades, nowadays it is seen more as a tendency for prosodic structure (cf. Féry 2017). Thus, if well motivated, prosodic structure may be recursive and a prosodic level may be skipped.

4.2.2 Proposal for the prosodic hierarchy in Vietnamese

In this section, a prosodic hierarchy for Vietnamese will be proposed. In order to do this, I will, first, introduce the concept of reduplication in Vietnamese, since Vietnamese reduplications play a major role in my argumentation.

Vietnamese has both semantic and phonological reduplications. Both of these are productive (cf. Ingram & Nguyễn 2006, p. 197). Semantic reduplications are repetitions of words with the same general meaning. *Xinh*⁴ and *đẹp* both mean 'beautiful' and can form a reduplication as in (1). As illustrated in (1) the meaning 'beautiful' is the same as compared to the individual words. However, reduplications like (1) may have a slightly more emphatic meaning compared to when the individual words occur on their own.

⁴ Note that *xinh* also means 'pretty'.

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- (1) *xinh đẹp*
‘beautiful’

As for phonological reduplications, Vietnamese possesses both total and partial reduplications. When *vàng* as in (2) occurs on its own it has the meaning ‘yellow’, and when it is reduplicated as in the full reduplication as in (3) it has the degraded meaning ‘yellowish’.

- (2) *vàng*
‘yellow’
- (3) *vàng vàng*
‘yellowish’

In (5) *sạch* ‘clean’ (see (4)) is shown in combination of its partial reduplication *sẽ*. Note that the syllable *sẽ* in (5) does not have a meaning on its own, but rather resembles *sạch* phonologically in beginning with the same consonant. Phonological partial reduplications in Vietnamese always contain one syllable that is responsible for the reduplicate’s meaning (base) and another syllable (reduplicate) showing some phonological similarities with the base. In (5), for example, the meaning of the base *sạch* ‘clean’ determines the meaning of the reduplication.⁵ Furthermore, both parts of the reduplication begin with the onset [s].

- (4) *sạch*
‘clean’
- (5) *sạch sẽ*
‘clean’

However, the meaning of partial reduplicates may also vary from the original meaning of the base in that the reduplication’s meaning is “rather ...”. In (6) the base *lạnh* means ‘cold’, whereas the reduplication as a whole in (7) means ‘rather cold’. Note that in this case the base occurs in the second syllable unlike the example in (5).

- (6) *lạnh*
‘cold’

⁵ Note that the meaning of (5) might be slightly more emphatic than the meaning of (4).

(7) lành lạnh
 ‘rather cold’

(Phạm 2001, p. 143)

My proposal for the prosodic hierarchy in Vietnamese is shown in Figure 4.3, which is the prosodic representation of the sentence in (8)b. The syllable is the smallest level of representation; there is no prosodic level below the syllable. Most Vietnamese words consist of just one syllable, therefore some authors doubt the existence of the prosodic word in Vietnamese (cf. Schiering, Bickel, & Hildebrandt 2010, Section 4.3.1). However, as can be seen from (8) a, the reduplicate *sẽ* is a syllable, but not a word, since it does not bear meaning on its own. *Sẽ* forms a prosodic word with *sạch* when it occurs after *sạch* in *sạch sẽ*. *Sạch* and the other syllable apart from *sẽ* may form a prosodic word on their own, since they all may carry meaning. Since *sạch* may form a prosodic word on its own and may also be part of the prosodic word *sạch sẽ*, I am assuming a recursive structure in this case. Loan words in Vietnamese may also contain more than one syllable. In (9) the French loan word *phó mát* (from the French word *fromage* ‘cheese’) contains two syllables. In this case, two syllables form one prosody word and no syllable forms an additional prosodic word, therefore there is no recursion (For the prosodic tree see Figure 4.4).

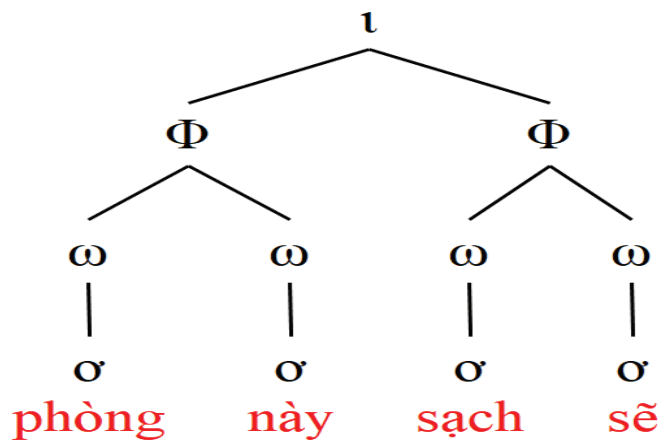


Figure 4.3 Prosodic tree of example (8).

(8)

- a. (((phòng) σ) ω)((này) σ) ω) Φ (((sạch) σ) ω (sẽ σ) ω) Φ) ι
 (((room) σ) ω)((this) σ) ω) Φ (((clean) σ) ω (REDUP⁶ clean σ) ω) Φ) ι

⁶ REDUP shows parts of a reduplicate.

- b. Phòng này sạch sẽ.
 room this clean
 ‘This room is clean.’

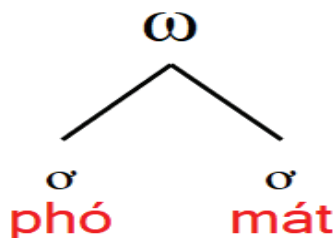


Figure 4.4

(9)

- a. ((phó)_σ (mát)_σ)_ω
 b. phó mát
 ‘cheese’

In (8), the noun phrase *phòng này* ‘this room’, and the stative verb *sạch sẽ* ‘(be) clean’ each form a prosodic phrase. This view is different from Thomas (1962), who does not assume that Vietnamese displays a difference between prosodic word and prosodic phrase. However, this would mean that syntactic phrases could not be identified prosodically, which would render the analysis of the syntax-prosody interface rather difficult. Therefore, I assume both the prosodic word and the prosodic phrase in Vietnamese. Also, my experiment in Chapter 5 clearly shows the existence of the prosodic phrase in Vietnamese.

The whole sentence in (8) forms an intonation phrase. Evidence for this can be taken from Đỗ et. al. (1998), who show that Vietnamese shows differences in expressing distinct sentence modalities (see Section 4.3.3). As illustrated in (8), I do not assume the existence of the foot, since I do not have enough evidence for it. However, I am aware that the foot might be helpful in analysing Vietnamese clitics as in A. H. Phạm (2008) (see Section 4.3.2).

4.3 Studies on the prosodic hierarchy

The prosodic hierarchy is a way of structuring prosodic units in a hierarchical way. Such structuring is helpful to analyse discontinuous noun phrases because it makes it possible to

group the different parts of the discontinuous noun phrases into appropriate units. However, considering research by different authors, it is unclear whether the prosodic hierarchy as proposed by Nespor & Vogel (1986) and as adapted by me in 4.2.2 is present in Vietnamese. Some authors argue that the prosodic hierarchy does not exist in Vietnamese (Section 4.3.1), other authors find mostly small effects that give evidence for the different units of the prosodic hierarchy (Section 4.3.2 and 4.3.3). In the following text, different points of view on the prosodic hierarchy or some of its units are presented:

A. H. Phạm (2008) (Section 4.3.2) argues against Schiering et al. (2010) while analysing Vietnamese clitics. She suggests that both the prosodic word and the foot are present in Vietnamese. Ingram & Nguyễn (2006) (Section 4.3.2) analyse whether there is a prosodic difference between phrase and compound. They show that in the case of maximal contrast such difference can be made. This suggests the existence of the prosodic phrase. Brunelle (2016) (Section 4.3.2) analyses prosodic phrases in four different corpora. He shows that there are small differences in comparing tones in prosodic phrase final to prosodic phrase internal position.

Both Cao (1998) and Brunelle (2017) (Section 4.3.2) analyse whether Vietnamese has stress. Since stress has to be situated at a specific level within the prosodic hierarchy, its existence would be an argument that either the foot or the prosodic word exists in Vietnamese. Furthermore, stress could explain the behaviour of the individual constituents in continuous and discontinuous noun phrases: prominent constituents are stressed whereas unstressed constituents are not prominent.

Đỗ et al. (1998) (Section 4.3.3) compare different sentence modalities, an important aspect for the study of the intonation phrase. This aspect is important to show to what prosodic unit sentences containing continuous and discontinuous noun phrases belong.

4.3.1 Against the prosodic hierarchy in Vietnamese

The earliest paper questioning the prosodic hierarchy in Vietnamese is the short paper of Thomas (1962) who suggests that there is no distinction between phrase and word in Vietnamese. A comparable view can be found in more recent research: Schiering, Bickel & Hildebrandt (2010) (first published in 2006) argue that only the prosodic phrase and syllable are attested prosodic units in Vietnamese:

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Under the Generality Assumption, two distinct levels of prosodic structure can be established for Vietnamese, namely the syllable as the locus for generalizations related to phonotactics, stress and tone, and the phonological phrase, which provides the basis for the iambic (or anapaestic) rhythm of the language. Neither the prosodic foot nor the prosodic word can be motivated for the language. (p. 680)

However, it is unclear what exactly the correlates of the iambic structure are and how exactly stress is assigned.

Several observations have led Schiering et al. (2010) to the proposal that the prosodic word does not exist in Vietnamese. One observation based on Thomas (1962) is that there seems to be no phonological distinction between monosyllabic to polysyllabic words. For their analysis Schiering et al. (2010) used data from Thompson (1965), Ngô (1984)⁷ and A. H. Phạm (2000) and did not conduct a study of their own (cf. p. 671).

Schiering et al. (2010) observe that monomorphemic two-syllable words like the French loan *va-li* ‘suitcase’ (10) and two-syllable words which contain two free morphemes like the word *một mình* ‘alone’ (11), where *một* means ‘one’ or ‘oneself’, both have stress on the second syllable. When it comes to phrases as in (12) stress is also found on the last syllable, therefore the authors argue that there is no prosodic distinction between the word and the phrase in Vietnamese.

(10) va LI
‘suitcase’

(11) một MÌNH
‘alone’

⁷ Note that Schiering, Bickel & Hildebrandt (2010) quote Ngô (1984) as Ngàn (1984). However, there seems to be confusion about the first name and the family name of the author. Other authors use the form Ngô (1984), for example A. H. Phạm (2008), Brunelle (2017), and Ingram & Nguyễn (2006).

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- (12) Tôi không BIẾT.
I not know
'I don't know.'

(Thompson 1965, p. 126ff., Ngô 1984, p. 101 quoted in Schiering et al. 2010)

I do not think that Vietnamese marks stress systematically, but rather what is observed as stress in (10) to (12) are phrasing effects found at the phonological phrase boundaries (see also the two experiments in Chapter 5).

Furthermore, Schiering et al. (2010) argue against Vietnamese tone harmony that is used to analyse reduplications. They do this in order to show that the tones in reduplicates are not predictable and that reduplications do not behave differently compared to other two-syllable units.

It has been proposed that some reduplications are based on so-called 'high tones' while others are based on 'low tones' (see for example A. H. Phạm 2000/1, and Ngô 1984).

The following tones are grouped into the category of high tones: level (*ngang*), rising (*sắc*) (in its two different forms) and broken (*ngã*). Low tones are the falling (*huyền*), the curve (*hỏi*) and the dropping (*nặng*) tone. (13) shows a reduplication of high tones, namely the level (*ngang*) and the rising (*sắc*) tone. In (14) we find a reduplication of low tones (dropping and falling tones) (Schiering et al. 2010).

- (13) mau mắn
'very fast' (A. H. Phạm 2000, p. 228, quoted in Schiering et al. 2010, p. 673)

- (14) ngặt nghèo
'very hard' (A. H. Phạm 2000, p. 228, quoted in Schiering et al. 2010, p. 673)

However, it seems that the tone harmony is not present with all reduplications of the language since there are also counter-examples to this harmony as in the following reduplication where the dropping tone (*nặng*) (low tone) is combined with the broken tone (*ngã*) (high tone):

- (15) lạnh lẽo
'very cold' (A. H. Phạm 2000, p. 228, quoted in Schiering et al. 2010, p. 673)

Different mechanisms have been proposed to explain the pattern. One possible solution is that the broken tone (*ngã*) and the curve tone (*hỏi*) can switch their membership from the group they

originally belong to. Thus, the broken (*ngã*) tone can become a low tone and the curve tone (*hỏi*) a high tone. Mechanisms which trigger a switch of tone range are the *Concave Tone Reversal* (Ngô 1984) and the *Flip-Flop rule* (Burton 1992 quoted in A. Phạm 2003, p. 17–18).

A. H. Phạm (2001) considers Flip-Flop rules as *unnatural* from a synchronic perspective (p. 144) and finds phonetic explanations for the fact that the broken (*ngã*) and the curve tone (*hỏi*) may belong to different tone registers. She does this in showing that not all parts of the curve tone (*hỏi*) are in all contexts lower than the broken tone (*ngã*). However, none of these authors considers the fact that the broken (*ngã*) and the curve tone (*hỏi*) are only distinct in the Northern dialect. In the Southern and Central dialect the broken tone (*ngã*) is pronounced similarly to the curve tone (*hỏi*). Therefore, it seems questionable to categorise the broken (*ngã*) and the curve tone (*hỏi*) into different categories.

None of the explanations given for the broken tone (*ngã*) and the curve tone (*hỏi*) provide evidence for divergences of the tone harmony with other tones. In (16) the rising tone (*sắc*) (high tone) is combined with the dropping tone (*nặng*) (low tone).

(16) *cứng cứng*

‘very hard’ (Thompson 1965, p. 156, quoted in Schiering, Bickel & Hildebrandt 2010, p. 674)

Considering different cases of reduplication in Vietnamese, Schiering et al. (2010) conclude that

...a number of sub-processes must be distinguished, each of them exhibiting its own degree of productivity and phonological predictability ... As a result, no general rule of tone harmony can be said to characterize Vietnamese reduplication in its entirety. (p. 675)

Schiering et al.’s (2010) radical view in not assuming a prosodic word in Vietnamese is also extended to grammar. The authors assume that there is no grammatical word in Vietnamese.

They argue for this while showing that some Vietnamese two-syllable words may be interrupted by intervening material. The reduplication *đỏ đỏ* ‘reddish’ (17) may, for example, be interrupted by the negator *không* ‘not’ as in (18). This questions the status of the Vietnamese word since words usually cannot be interrupted.

(17) *đỏ đỏ*

‘reddish’ (Noyer 1998, p. 80)

(18) *Ô tô của tôi không đỏ (không) đỏ, nhưng mà
car belong me not REDUP (not) red, but rather
tím tím
REDUP purple*

‘My car is not reddish, but rather purplish.’ (Noyer 1998, p. 82)

Furthermore, some compounds may change the constituent order as in (19) and (20). Again, such behaviour is rather unusually for words.

(19) *quần áo*

‘trousers’

(20) *áo quần*

‘trousers’ (Ngô 1984, p. 6, quoted in Schiering et al. 2010)

However, the examples given in (17) through (20) are only transferable to some Vietnamese words. For most Vietnamese reduplications it is not possible to insert elements between them, and for most disyllabic words, the order of the two syllables may not be changed.

To sum up, the existence of phonological reduplications in Vietnamese is proof that the prosodic word does exist because only the base contributes to the meaning of the reduplication. The reduplicate does not have a meaning on its own.⁸ In examples (13) to (16) the base constitutes the first syllable and in (17) it is the second syllable. The reduplicate is therefore not a prosodic word (see Section 4.2.2). I assume that tone harmony (A. H. Phạm 2000/1, Ngô 1984) describes a tendency of how Vietnamese reduplications are formed, but it is not a general rule for it.

4.3.2 Evidence for the existence of the prosodic word and prosodic phrase

Several studies can be taken as evidence for the existence of prosodic word and prosodic phrase. However, these studies are all very different from each other and partly difficult to relate. A. H. Phạm (2008) shows the existence of the prosodic word through the analysis of clitics. Other

⁸ There may be other homophonous other words, which have a completely different meaning.

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authors focus on the difference between a special type of prosodic word namely compounds and prosodic phrase (Ingram & Nguyễn 2006). Both Ingram & Nguyễn (2006) and Brunelle (2016) show that there are small effects giving evidence for the existence of the prosodic phrase in Vietnamese: Ingram & Nguyễn (2006) show that under the condition of maximal contrast differences are made between phrase and compound. Favouring a distinction between prosodic word and phrase. Brunelle (2016) demonstrates effects comparing phrase internal to phrase final position. In Brunelle (2017) disyllabic utterance, are analysed, showing final lengthening effects. Both Ingram & Nguyễn (2006) and Brunelle (2017) argue that Vietnamese does not have stress. In order to better discuss this topic, an alternative approach to this namely Cao (1998) will be presented, the only traditional Vietnamese linguist discussed in this section. Therefore, his approach is less theoretical compared to the other authors. He argues for lexical stress in Vietnamese in showing that this stress may have a meaning distinguishing function.

A. H. Phạm (2008) analyses clitics in Vietnamese in order to show the existence of the prosodic word in Vietnamese arguing against Schiering et al. (2010).

Clitics are usually analysed as elements that do not take stress themselves, but are dependent on their host. In Vietnamese “[c]litics attach to the host on their left except when the clitic is phrase-initial when it much [*sic*; must] attach rightward” (A. H. Phạm 2008, p. 14). A clitic and its host may form a foot since the clitic itself does not bear stress.

(21) shows an example of a clitic in Vietnamese. Host and clitic are in parenthesis. *Nə-ris* ‘s/he’ attaches to *co-lev* ‘allow’ while losing its first consonant *n*.

- (21) $\epsilon m\text{-lev}^{910}$ (co-lev nɔ-ri) $\eta i\text{-cur}$ $z o j\text{-fal}$
 1SG allow 3SG rest already
 ‘I already fired him.’
 → $\epsilon m\text{-lev}$ (co-lev ɔ-ri) $\eta i\text{-cur}$ $z o j\text{-fal}$ (A. H. Phạm 2008, p. 8)

It seems that there is no one-to-one relationship between grammatical and prosodic word, since one part of a disyllabic grammatical word (for example reduplications, proper names and compounds) can be part of a clitic-host-complex while the other part forms a separate prosodic word (cf. p. 8-9). In (22) the first syllable of $l a:m\text{-fal}$ $s a:w\text{-lev}$ ‘how’ turns into $\eta d r o p$ and then attaches to the second syllable of the (partial) reduplicate $l \grave{a} m\text{-cur}$ $k \grave{a} m\text{-brok}$ ‘silly’ so that the clitic-host-complex ($k \grave{a} m\text{-brok} \eta\text{-fal}$) is created.

- (22) $m i \eta\text{-fal}$ $l \grave{a} m\text{-cur}$ ($k \grave{a} m\text{-brok}$ $l a:m\text{-fal}$) $s a:w\text{-lev}$
 1SG silly how
 ‘How silly I am!’
 → $m i \eta\text{-fal}$ $l \grave{a} m\text{-cur}$ ($k \grave{a} m\text{-brok} \eta\text{-fal}$) $s a:w\text{-lev}$ (A. H. Phạm 2008, p. 9)

A. H. Phạm (2008) demonstrates the existence of the prosodic word and foot in Vietnamese: also the syllable and phonological phrase are relevant units in Vietnamese as in Schiering et al. (2010). My own research on discontinuous noun phrases in Vietnamese supports this view.

Ingram & Nguyễn’s (2006) study is important for our purposes because from their findings it can be concluded that Vietnamese does not have lexical stress. Furthermore, a contribution to the research on prosodic phrases is made: in the course of an acoustic analysis, Ingram & Nguyễn (2006) discover that there is generally no distinction between phrase and compound, but that in conditions of maximal contrast (minimal pairs) effects on pause and juncture are found. Ingram & Nguyễn’s research can at least partly be seen as evidence for the *minimal pause groups* (prosodic phrases) suggested earlier by Thompson (1963).

Ingram & Nguyễn (2006) compare compounds to similar corresponding phrases that consist of the same words, but have a different meaning as in (23) and (24).

⁹ Literally ‘younger sibling’.

¹⁰ The nomenclature of the tones was changed in accordance with the system generally used in this book. However, the following abbreviations are used: *lev*-level tone, *fal*-falling tone, *ri*-rising tone, *cur*-curve tone, *brok*-broken tone and, *drop*-dropping tone.

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(23) Hoa hồng thì đẹp.
flower rose TOP beautiful
'A rose is beautiful.'¹¹

(24) Hoa hồng thì đẹp.
flower pink TOP beautiful
'A pink flower is beautiful.'¹²

In their acoustic analysis, Ingram & Nguyễn (2006) discover that there is generally no distinction between phrase and compound, but that in conditions of maximal contrast effects on pause and juncture can be found. Maximal contrast means that the participant was asked to make a clear difference between the phrase and the compound, so that the listener could clearly distinguish the different meanings.

The study shows no juncture pauses under the compound condition. However, in the case of phrases, juncture pauses are used in most of the cases: When the noun is followed by an adjective, juncture pauses are used in 80% of the phrasal cases. When a noun is followed by a verb they are used in 65% of the phrasal cases, and with two nouns following each other juncture pauses are used in 15% of the cases. Ingram & Nguyễn (2006) conclude from their findings that Vietnamese does not possess a phonological strategy to distinguish between phrases and compounds. However, Vietnamese speakers are able to use the universal strategy of using junctures to distinguish phrases and compounds when the situation strongly requires the differentiation of the two categories. From these findings, we can conclude that Vietnamese may use junctures to mark prosodic phrases.

Brunelle (2016) analyses prosodic phrases in Southern Vietnamese spontaneous speech (two televised interviews, two televised comedy skits and four additional recordings of spontaneous speech involving conversations between same-age and same-sex friends). He assumes a mapping from syntax to prosody as in Nespor & Vogel (1986) and Selkirk (2011)¹³. This means he expects prosodic boundaries at the same places as syntactic boundaries. The main idea of

¹¹ A collective reading is also possible.

¹² A collective reading is also possible.

¹³ Nespor & Vogel (1986) has been described in Section 4.2.1.

Selkirk (2011) is that syntactic constituents are matched to corresponding prosodic constituents. A syntactic clause, for example, is matched to an intonation phrase, etc.

Brunelle's main findings are very small differences in the contours of individual tones when comparing phrase-internal to phrase-final position (see Figure 4.5). Figure 4.5 shows the normalized mean F0 contour (z-score) for all tones in prosodic-phrase-internal (left) and prosodic-phrase-final position (right): the overall pitch range of the individual tone is wider in phrase-final position compared to phrase-internal position. Brunelle (2016) links this back to a duration effect.

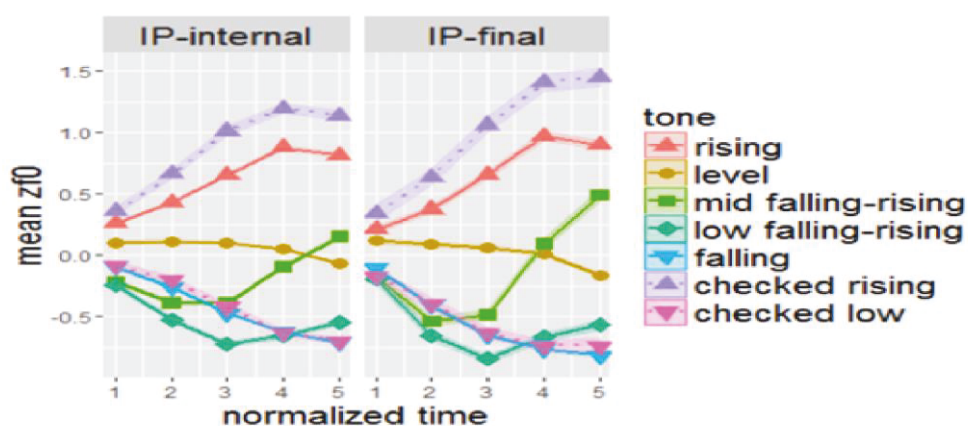


Figure 4.5 F0 contour in intonation phrase internal and final position, from Brunelle 2016, p. 61

The study of Brunelle (2016) shows that although F0 in Vietnamese is already occupied by lexical tone, it can still be used to mark prosodic structure, more precisely the prosodic phrase. However, the contour of the lexical tones are consistent.

Brunelle (2017) compares several different kinds of Vietnamese disyllabic utterances (for example compounds and loan words) in Southern Vietnamese. He finds that there is generally no evidence for prosodic prominence of the second syllable¹⁴ and concludes that there is no evidence for lexical stress in Vietnamese.

By contrast, Cao (1998) assumes lexical stress in Vietnamese.

Cao (1998) describes Vietnamese as a language with stress. With the help of analytical methods (kymograph, oscillograph and spectrograph) it was discovered that

¹⁴ This point of view is contrary to Ingram & Nguyễn (2006).

...trong ngữ điệu bình thường, một tiếng có trọng âm dài hơn một tiếng không có trọng âm (khinh âm), từ 1,5 lần đến 4 lần, mạnh hơn từ ba đến năm lần, và có một đường nét thanh điệu trọn vẹn hơn hẳn, nhất là các tiếng có thanh sắc, hỏi, ngã hay nặng. Ở các tiếng không có trọng âm, thanh sắc mất hẳn phần nửa sau, cho nên thấp hơn thanh sắc ở các tiếng có trọng âm khá nhiều, thanh hỏi mất hẳn phần đi lên, thanh ngã và thanh nặng mất phần tiếp theo âm xiết thanh hầu, cho nên có thể có sự trung hòa hóa (neutralization) giữa thanh này và thanh huyền (cf. mặc cả/mà cả). (p. 137-138)

... when it comes to normal intonation a stressed word is 1,5 to 4 times longer than an unstressed word, three to five times stronger, and the tone line is by far fuller, especially with words that have the rising (*sắc*), the curve (*hỏi*), the broken (*ngã*), or the dropping tone (*nặng*). In unstressed words the rising tone (*sắc*) loses its second half completely, therefore it is relatively low, the curve tone (*hỏi*) loses its rising part completely, the broken tone (*ngã*) and the dropping tone (*nặng*) lose their glottalization and the following part, so there might be neutralization between this tone and the falling tone (*huyền*) (cf. mặc cả /mà cả ‘bargain’¹⁵).

Cao (1998) also shows that sometimes stress can be meaning distinguishing. In the following phrase, the word *cho* can either mean ‘for/to give’ or ‘instead of’ depending on its accent as in (25) and (26). However, the examples below are rather exceptional for Vietnamese and may also be explained by assuming different prosodic phrasing, namely that in (25) a prosodic phrase boundary is found at CHO ‘to give’ and in (26) at VÈ ‘home’.

- (25) lấy TIỀN về CHO BẠN
 take money home to give friend
 ‘take money home to give it to a friend’

¹⁵ Different possible pronunciations of the first syllable of the two-syllable word ‘bargain’: In the first case the first syllable has the dropping tone (*nặng*): *mặc*, whereas in the second case, the falling tone (*huyền*) is found: *mà*. Note that also in the first case the syllable is closed, whereas in the second case it is open. Furthermore, the vowel quality differs.

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- (26) *l*á*y* TIỀN VÈ cho BẠN
take money home instead of friend
'take money home for the friend/for him' (p. 639-641)

I assume that Vietnamese does not have lexical stress. This point of view is also endorsed by Emeneau (1951).

However, Brunelle (2017) observes phrase-final lengthening effects. Final lengthening effects were also found in my experiments reported in Chapter 5.

4.3.3 *Evidence for the intonation phrase*

Đỗ et al. (1998) state that lexical tones are often adapted and changed depending on the context:

In continuous speech, tones seldom reach their target values; they are generally affected by context: stressed vs. unstressed syllables; influence of neighbouring tones; tempo... These influences have rarely been studied. (p. 398)

The authors analyse sentences with different modalities. The sentences were entirely composed of a single tone in order to avoid having many experimental conditions. This gives us a hint as to how difficult research on Vietnamese intonation is. Đỗ et al. (1998) show that Vietnamese interrogatives are produced with a higher register (cf. p. 404, 411), which indicates the existence of Vietnamese intonation phrases. As shown in Section 4.2.2., I also assume the existence of an intonation phrase in Vietnamese. This means that whole sentences containing continuous and discontinuous noun phrases form intonation phrases.

4.4 **Earlier Studies on Vietnamese intonation**

The relative neglect of intonation in Vietnamese in the last decades is partly due to the fact that Vietnamese is a tone language with 6 tones in the Northern and 5 tones in the Southern dialect and that it additionally has several sentence-final particles (at least 20), which take over the function of intonation in so-called “intonation” languages. These properties render the analysis of Vietnamese rather arduous. Due to the lack of detailed study, it was assumed that lexical tones were consistent and that using sentence final particles instead of intonation would help to avoid the discrepancy between lexical tone and intonation (cf. Hạ 2012, Yip 2002).

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Yet recent research on Vietnamese intonation has revealed that lexical tones may be pronounced in different ways depending on whether they are in a certain context compared to when they are in isolation. Comparing discontinuous noun phrases to continuous noun phrases is a way of placing the same words into two different prosodic contexts therefore intonation effects are predicted.

4.4.1 Studies on tonal coarticulation

In this section, I will present studies on tonal coarticulation in Vietnamese. Tonal coarticulation is defined in the following way:

... tonal coarticulation is a surface phonetic process by which the shape of a tone is modified by neighbouring tones in a gradient manner (for example, a tone tends to start higher after a high tone than after a low tone). (Brunelle, Hà & Grice 2016, p. 24)

Han & Kim (1974) is one of the earliest, if not the earliest, study on tonal coarticulation in Vietnamese. Brunelle (2009) studies the same topic, using modern linguistic theory. Section 4.4.2 discusses whether there is tone sandhi in Northern Vietnamese. The topic of tonal coarticulation is especially interesting because tonal coarticulation can give us hints as to whether certain prosodic elements belong to the same constituents or to different ones.

One of the first analysis of intonation and coarticulation in Vietnamese is the study by Han & Kim (1974). In this study, Northern Vietnamese monosyllabic and disyllabic utterances were compared to each another. The target words were embedded into the carrier sentence “I read the word ...” (Tôi đọc chữ ...).

Target tone	Highest F0 contour	Lowest F0 contour
level tone	broken tone	falling tone
rising tone	rising tone	falling tone
broken tone	level tone	falling tone
falling tone	level tone	falling tone
curve tone	level tone	curve tone
dropping tone	level tone	curve tone

Table 4.3 Highest and lowest F0 contours for each tone when the target syllable is the first one of a disyllabic utterance, regressive coarticulation

Table 4.3 shows Han & Kim's (1974) findings of the highest and lowest F0 contours for each tone when the target syllable is the first one in the case of regressive coarticulation. These findings are additionally described below:

The level tone (*ngang*) displays its highest F0 contour when it occurs before the broken tone. The rising tone (*sắc*) reaches its highest F0 before another rising tone (*sắc*) and its lowest F0 contour before the falling tone (*huyề̀n*). The falling tone (*huyề̀n*), the broken tone (*ngã*), the dropping tone (*nặ̀ng*), as well as the curve tone (*hỏi*) show their highest F0 contours before the level tone (*ngang*). The level (*ngang*), the rising (*sắc*), the broken (*ngã*), and the falling tone (*huyề̀n*) show their lowest F0 contour before a falling tone (*huyề̀n*), whereas the curve (*hỏi*) and the dropping tone (*nặ̀ng*) display their lowest F0 contour before the curve tone (*hỏi*). The highest variant of the curve tone (*hỏi*) occurs before the level tone (*ngang*).

Target tone	Highest F0 contour	Lowest F0 contour
level tone	broken tone	curve tone
rising tone	rising tone	curve tone
broken tone	level tone	curve tone
falling tone	rising tone	falling tone
curve tone	broken tone	curve tone

Table 4.4 Highest and lowest F0 contours for each tone when the target syllable is the second one of a disyllabic utterance, progressive coarticulation

Table 4.4 shows the main results of the pitch contours for the second syllable of a disyllabic utterance. A general observation of the study was that the pitch range is much bigger for the second syllable. For most of the tones, except for the falling tone, the curve tone (*hỏi*) occurs before the lowest variant of the tones. However, for the falling tone, another falling tone occurs before its lowest F0 contour. As for the broken tone (*ngã*), its highest F0 contour occurs after the level tone (*ngang*). The highest version of the rising tone occurs after another rising tone (*sắc*). As for the falling tone, its highest F0 also occurs after a rising tone (*sắc*). The curve tone (*hỏi*) has its highest F0 contour after a broken tone (*ngã*).

Han & Kim (1974) summarize their main findings: “A careful examination of the environments of the extreme variants of the six tones ... reveals that a tone tends to be a high variant before or after a broken, rising or level tone and a low variant before or after curve or falling tone.” (p. 226).

As a general observation, it can be seen that the preceding tone influences a given tone more than does the following tone. Therefore, we can conclude that Vietnamese displays more progressive than regressive tonal coarticulation. Progressive tonal coarticulation will also be shown in the experiments in Chapter 5.

Furthermore, Han & Kim (1974) have another interesting finding: taking a closer look at the disyllabic utterance *bàn ăn* ‘dining table’, Han & Kim (1974) found that the falling tone of *bàn* ‘table’ is actually not falling. Still, native speakers were able to identify this tone after hearing the complete target word (cf. p. 230-232). In the experiments in Chapter 5, we do not find such an effect for the falling tone: its general contour is rather consistent despite different contexts.

Brunelle (2009) analysed tonal coarticulation in Northern and Southern Vietnamese. To this end, he constructed a read speech experiment involving five speakers of Northern Vietnamese (NVN) (3 women, 2 men) and six speakers of Southern Vietnamese (SVN) (3 women, 3 men).

In order to restrict other influences, Brunelle (2009) looked at the F0 variation of the vowels /i/¹⁶ and /a/. These vowels occurred in a carrier sentence and were separated from each other by the consonant /m/ as illustrated in (27). Note that C = consonant and W = word.

¹⁶ One target sentence contained the vowel /u/ instead of /i/ for semantic reasons.

(27) ...W W W W Ciⁱma sem oŋ W kɔ W (W) xoŋ
 PART see grandfather have not

‘Does ... see that he has ...?’ (roughly, Brunelle 2009, p. 52)

The target sentence was syntactically and semantically well-formed. The participants were asked to treat the target words as proper names. The target words contained all possible combinations of 2 tone sequences. Overall, there were 36 target sentences for the Northern dialect and 25 sentences for the Southern dialect¹⁷ (cf. Brunelle 2009, p. 52).

The main observation is that

[n]ormalized tone curves show that progressive coarticulation is much stronger than regressive coarticulation in both dialects, despite the fact that the stress pattern of the frame sentence should favour regressive coarticulation.¹⁸ (Brunelle 2009, p. 54)

Figure 4.6 shows the normalized F0 contour of the Northern Vietnamese speakers. The right column shows the progressive articulation while the left column shows the regressive one. It can be seen that the variation in the following tone in the right column is much greater than the variation in the preceding tone in the left column.

In Figure 4.7 regressive and progressive articulation are shown for the Southern dialect. Again, the right column shows the progressive articulation, while the left column shows the regressive one. The Southern dialect also displays more progressive than regressive coarticulation. However, altogether the coarticulation in the Southern dialect was not as strongly realized as in the Northern dialect (cf. Brunelle 2009, p. 57). Brunelle concluded that the reason why Southern Vietnamese displayed fewer coarticulation effects was that in Southern Vietnamese the identification of tones relies only on F0 variation and not on glottalization as in Northern Vietnamese. This gives Southern Vietnamese fewer possibilities for tonal variation.¹⁹

¹⁷ There are 6 tones in the Northern dialect, therefore we calculate 6x6, and 5 tones in the Southern dialect therefore the calculation is 5x5.

¹⁸ Considering the study of Potisuk, Gandour & Harper (1996) on Thai, stress on the second syllable should elicit progressive coarticulation.

¹⁹ In my study, glottalization was also found in speakers of Southern Vietnamese (see Section 5.4.4.1). However, further research is needed in order to show whether this glottalization is also used to identify meaning.

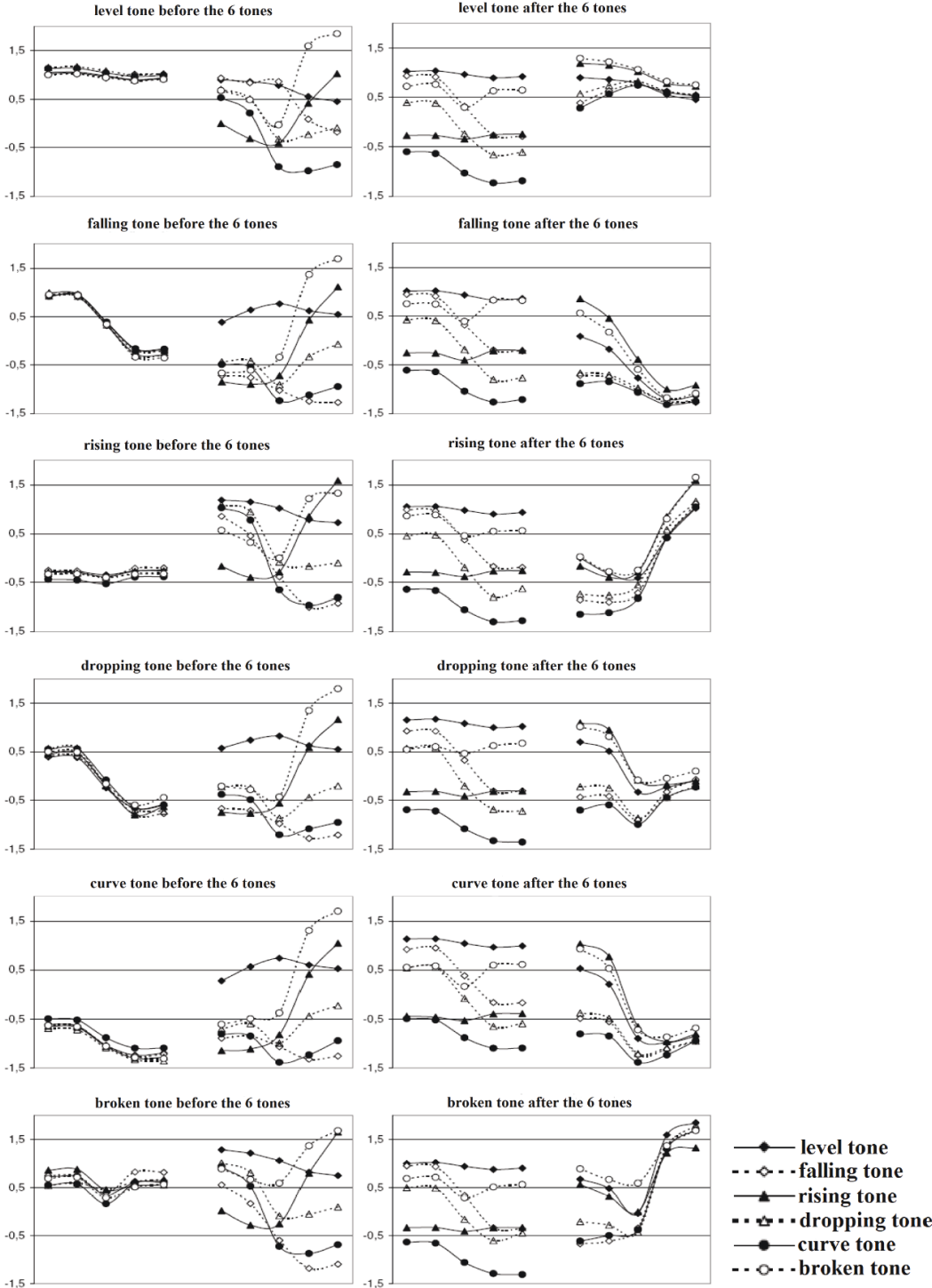


Figure 4.6 Progressive and regressive coarticulation in Northern Vietnamese, modified from Brunelle (2009), p. 55

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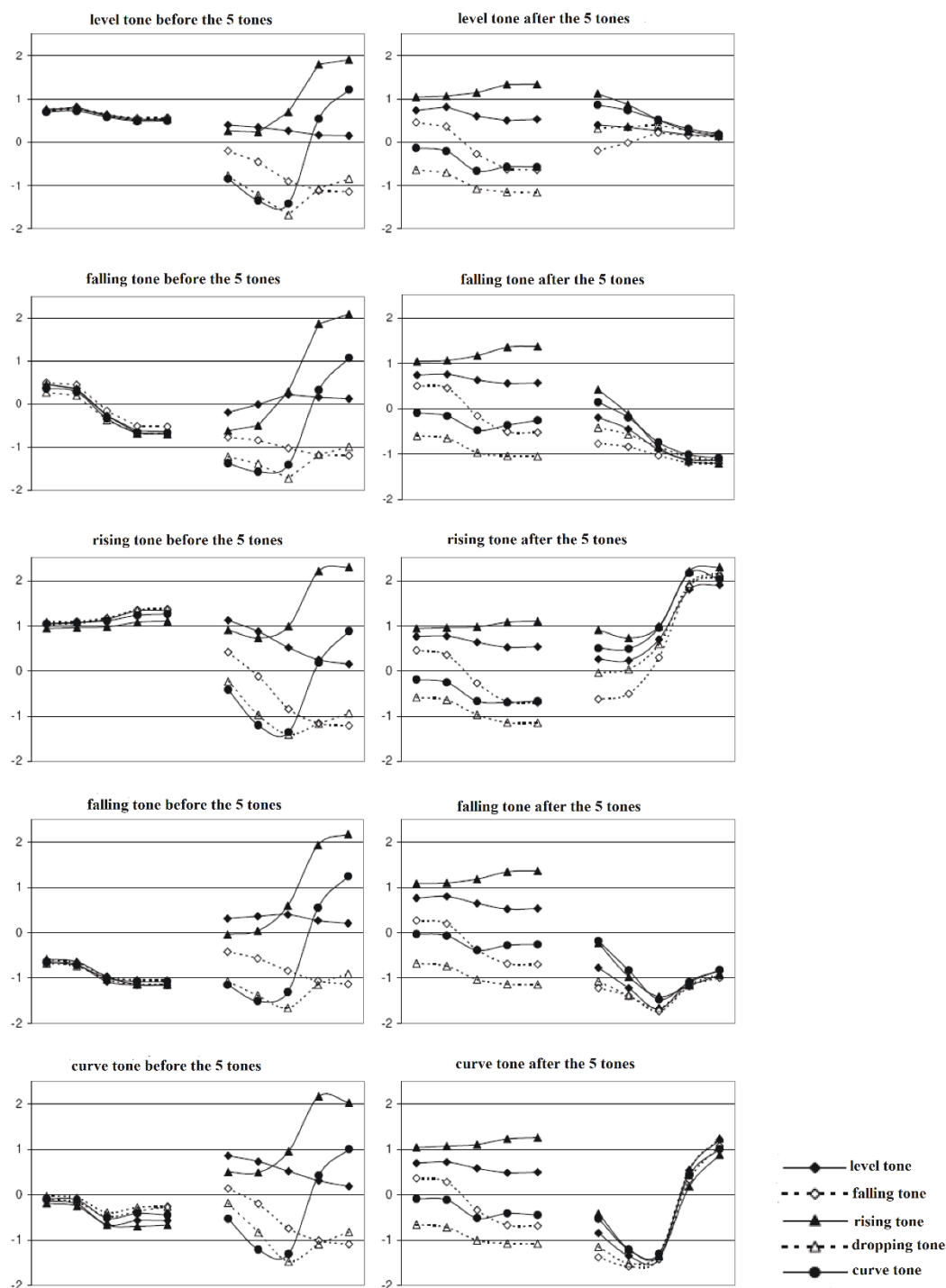


Figure 4.7 Progressive and regressive coarticulation in Southern Vietnamese, from Brunelle (2009), p. 56

4.4.2 Are there tone sandhi effects in Northern Vietnamese?

Brunelle et al. (2016) analyse tone sandhi effects in Northern Vietnamese. It turns out that Northern Vietnamese does not display any clear effects of tone sandhi, but that it may be in a stage of developing tone sandhi.

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In order to distinguish between tonal coarticulation and tone sandhi, Brunelle et al. (2016) base their work on Shen (1992), providing the following definition:

... tone sandhi is attributed to language-specific morphophonemic constraints, while tonal coarticulation is attributed to language-independent bio-mechanical constraints. ... in tone sandhi, tonal change may result from tonal assimilation or dissimilation; in tonal coarticulation, tonal change is uniquely a result of tonal assimilation. ... in tone sandhi, the tonal identity is changed; in tonal coarticulation, the tonal identity is preserved. (Shen 1992, p. 83)

In order to look at a context of possible tone sandhi, the authors conducted a production and a perception experiment about the rising tone (*sá̌c*). Earlier research has shown that a tone's endpoints are decisive in order to identify Vietnamese tones. The rising tone (*sá̌c*) is articulated as clearly rising in phrase-final position. In other positions it is relatively flat and the "rise is delayed until the beginning of the following syllable" (p. 25). Furthermore, it has been observed that "the endpoints of the rising and falling tones in the first syllable have an almost identical F0, yet the beginning portions of the following tones are much higher after the rising tone than after the falling tone" (p. 25). This is why the sequence rising tone – level tone constituted the target words. The target words, as all other test words, were nominal disyllabic compounds. Other test words consisted of the sequence falling-rising. The control compound was "rising-falling". This sequence was chosen as the control because it displays a salient peak delay.

In a training session, speakers were familiarized with the target words. After this session, participants had to perform a map task. To this end, same-sex pairs were formed. One person described the path indicated on their map and the other one had to draw the path into their own map, which differed slightly from the map of the interlocutor and did not contain the indicated way.

In order to analyse their results, Brunelle et al. (2016) fitted linear mixed models. It turns out that intensity and syllable duration do not play a significant role in identifying the target tone.

Furthermore, there was no statistically significant difference in the F0 of the first syllable's rising tone when comparing 10 different F0 sample points in two different conditions (rising-

level, rising-falling). Therefore, there are no allophonic variants of the rising tone and thus no tone sandhi (cf. p. 29).

Still, some speakers (5 out of 20 speakers) did not make a clear distinction in starting points of the first syllable, but show a peak delay in the second syllable as shown in Figure 4.8. The falling tone and the rising tone are confused on the first syllable. This could be seen as a hint that tone sandhi might develop in the future.

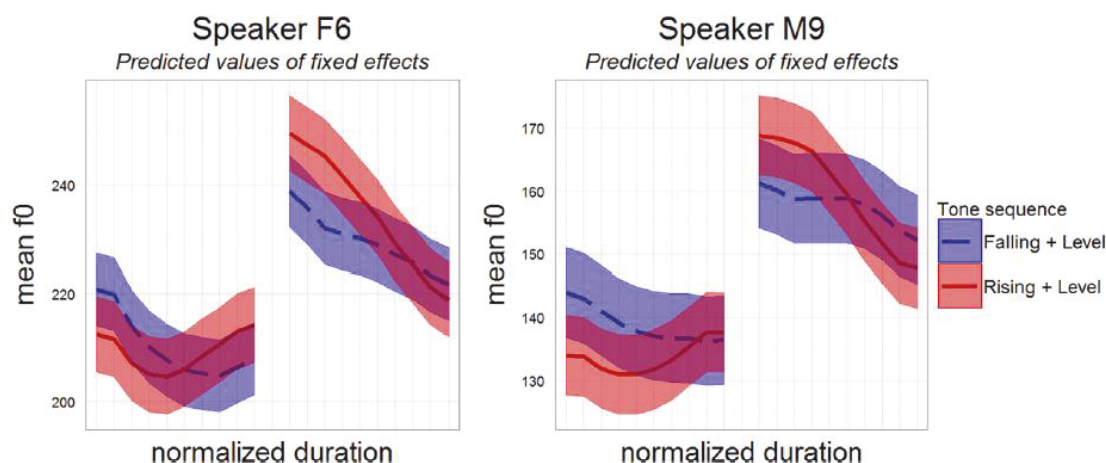


Figure 4.8 Confusion of falling and rising tone by two speakers, from Brunelle et al. 2016, p. 31

Brunelle et al. (2016) have shown that there is currently no tone sandhi in Northern Vietnamese. In my experiments in Chapter 5, I did not find tone sandhi effects in either in Northern or Southern Vietnamese.

4.4.3 Intonation effects associated with communicative functions

In this section, intonation effects associated with different communicative functions are analysed. This is important because it is shown that there are contexts in which Vietnamese uses intonation and therefore lexical tone is not expressed in the same way as in isolation. These findings are also relevant in a comparison between continuous to discontinuous noun phrases because only if a tone language allows intonation effects in general we may also expect them comparing the special contexts of discontinuity and continuity. Hà (2012)/Hà & Grice (2010) analyse discourse markers in different contexts. Brunelle (2016) treats the same topic, but also analyses different final syllables in different communicative situations in general. This topic is important since lexical tones in different contexts are analysed. It is shown that Vietnamese tones may change their F0 contour depending on different communicate functions. However, the different authors reach varying conclusions about the degree to which intonation may

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change the F0 contour of lexical tones in Vietnamese: while Hà (2012)/Hà & Grice (2010) find rather strong effects, the effects found by Brunelle (2016) are rather small. These findings have motivated me to analyse the behaviour of Vietnamese tone within continuous and discontinuous noun phrases as well, since in general Vietnamese tones may be flexible within certain communicative settings, however, it is not clear to what extent.

Hà & Grice (2010) show that in Vietnamese telephone conversations, function words that are used as a means of backchanneling or as requests for information may be pronounced with an intonation that is completely different from the way the words are pronounced in isolation. Backchannels are “utterances spoken by the hearer to signal her/his attention to the current speaker’s talk without taking the floor ...” (Hà & Grice 2010). The following table shows how the words *ờ* and *ừ* that usually have falling tone, have rising intonation in a context where information is requested or when used as a turn exit technique. *Vâng* ought to be pronounced with a continuous high tone (level tone). However, the table below shows that it can be pronounced as both falling and rising depending on the context.

Word	Stylised contour in citation form	Backchannels (BC)	Requests for info (Req) (female)	Turn exit technique (T-Ex)
<i>ờ / ừ</i> [ɤ]/[ɯ]	-----	-----	-----	-----
<i>vâng</i> [vɤŋ]	-----	-----	-----	-----

Table 4.5 F0 contour of function words in different communicative situations, from Hà & Grice 2010, p. 2

Brunelle (2016) analyses different types of communicative functions of intonation phrases, namely continuative, declarative, imperative, exclamative and interrogative function. In Figure 4.9 tone contours in different communicative functions with the different tones are shown. All tones occur in syllable-final position after excluding final particles. Again, the intonation type had only very limited effects on the tone. However, exclamatives had for most tones a higher F0 compared to other intonation types.

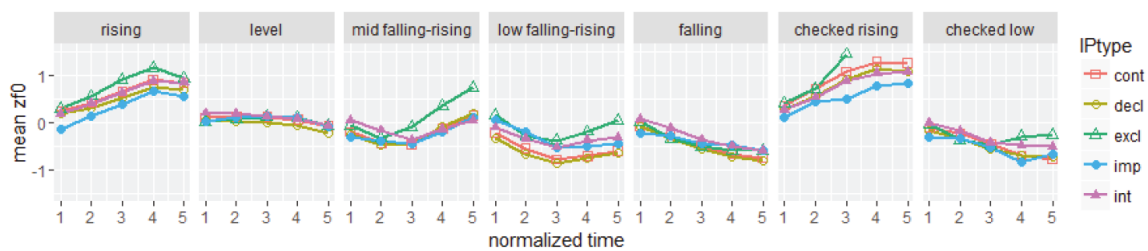


Figure 4.9 Realization of tones in syllable final position in different intonational types, from Brunelle 2016, p. 62

Brunelle (2016) also analyses the following monosyllabic discourse markers: ò [ɤ], ù [i] and dạ [ja]. Ò [ɤ] and ù [i] can be translated as ‘hmmm’, whereas dạ [ja] is a marker of respectful acknowledgement. All of the discourse markers can also mean ‘yes’ depending on the context. Ò [ɤ] and ù [i] both have the falling tone (*huyền*), while dạ [ja] has the low falling-rising dropping tone (*nặng*).

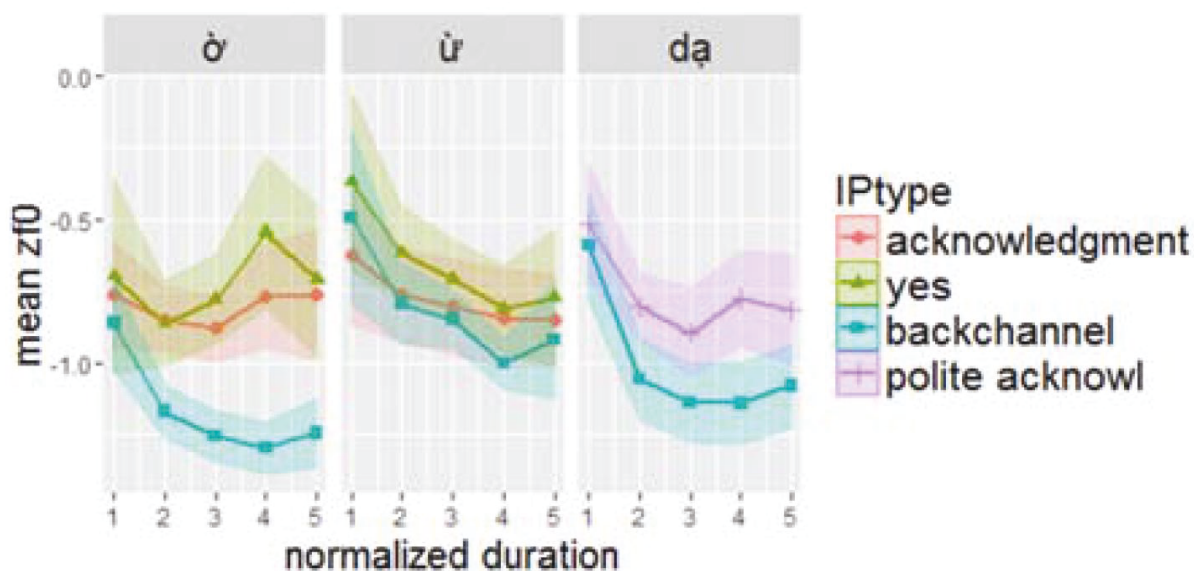


Figure 4.10 F0 contour of ò, ù and dạ in different communicative situations, from Brunelle 2016, p. 62

As can be seen from Figure 4.10 ù is realized as a falling tone in all contexts, while the other discourse markers display more variation. Ò is falling in the case of backchanneling, however the range is larger than usual; for the other context types the first part of the contour is falling and then rising again. The contour of dạ resembles the falling tone (*huyền*) in the case of polite acknowledgement. In this case, its F0 contour is higher compared to when it occurs with backchanneling.

Furthermore, Brunelle (2016) compares the beginning and end points of the different types of communicative functions. It turns out that there is only very little variation between the different

intonation phrase types. Still, two general tendencies are shown: occurrences of emphatic agreement had a high endpoint, whereas backchannels were produced with low endpoints.

Brunelle (2016) evaluates the small intonational effects as minimal and therefore concludes "...there is little evidence that the language uses discrete categorical intonational targets at the end of intonational phrases." (Brunelle 2016, p. 63). The small effects the author found can be linked with a *universal code*.

Brunelle's (2016) findings show that intonational effects in Vietnamese can be quite small in certain contexts. This makes it interesting to analyse intonation in Vietnamese in other contexts as well.

4.4.4 Prosodic aspects of information structure in Vietnamese

Information structure is often expressed by means of phonology (cf. Halliday 1967). Focus, for example, can be realized by stress in English (cf. Halliday 1967, for instance) or by phrasing in French (cf. Féry 2001). Therefore, it is interesting to see how information structure is realized in the tone language Vietnamese. As shown in Section 1.11, discontinuous noun phrases need a special information structural setting in order to be acceptable, therefore this topic is important for the main theme of this book. After the more general introduction to information structure in Vietnamese in Section 1.3, this section will treat prosodic aspects of information structure in more detail. Michaud & Vũ (2004) assume that lengthening effects under emphasis (corrective focus) are speaker-dependent while an increase in F0 slope is a general strategy of "emphasis". Jannedy (2008) shows general strategies of focus. Brunelle (2017) shows that the realization of focus is at least partly speaker specific.

Jannedy (2007/2008) analyses the perception and production of focus in Vietnamese. Since the experiments in Jannedy (2008) are comparable to those in Jannedy (2007), I will only present the most recent study. Jannedy (2008) looks at a single sentence occurring in information-structurally different contexts, namely with different kinds of foci.

In a first experiment, Jannedy (2008) tested whether six native listeners of Vietnamese were able to trace back at which wh-word focus conditions a particular target sentence was uttered. The participants had to evaluate three basic target sentences within five different focus conditions. Each of the 15 sentences occurred two times, since there were two sets of recordings: one set contained recordings of a female speaker of Northern Vietnamese and the

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other set were recordings of a male speaker of the same dialect. All of the target sentences were played five times. The results are presented in Figure 4.11:

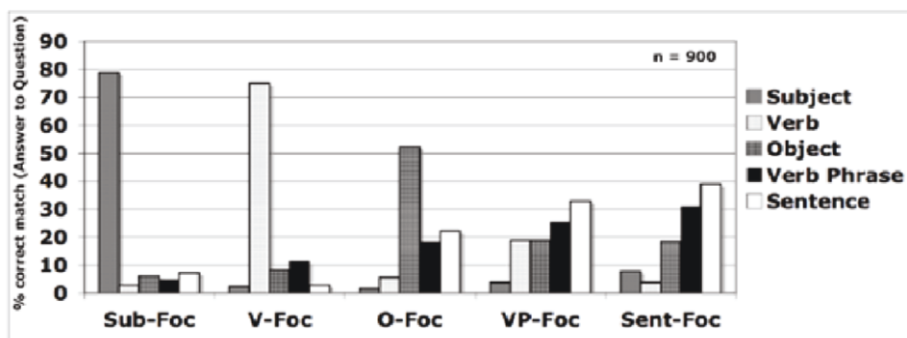


Figure 4.11 Identification of the different focus conditions, from Jannedy 2008, p. 8

It can be seen from Figure 4.11 that VP focus was mostly judged as sentence focus (33%), whereas the target focus condition was only judged correctly in 26% of the cases. For the other focus conditions, the success rates for the target focus conditions were always the highest. In the case of subject focus the correct identification rate is 79%, for verb focus it is 75%, and for object focus it is 52%, whereas for sentence focus it was only 39%. It is not clear which of the acoustic parameters are responsible for the correct identification of the focus.

For the second experiment, Jannedy (2008) analysed 3 types of three-word target sentences, where each word in a sentence had the same tone. (28) shows the sentence type for the level tone (*ngang*), (29) shows the sentence type for the falling tone (*huyền*) and in (30) the sentence type for the rising tone (*sắc*) is shown.

(28) Lê mua nho.

Lê buy grape

‘Lê buys grapes.’

(29) Ngà làm nhà.

Nga make house

‘Nga builds a house.’

(30) Má lấy muối.

mother take salt

‘Mother takes salt.’

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The target sentences were put into contexts eliciting sentence focus, subject and object focus, as well as verb focus. For the level tone (*ngang*) there was a slight F0 rise under focus, however this rise was not significant. The vowel length in the case of subject and verb focus was significantly longer compared to sentence focus ($p < 0.001$). For the object focus case the duration of the vowel was significantly shorter ($p < 0.02$) than for sentence focus.

The F0 variation of the rising tone (*sắc*) is shown in Figure 4.12.

Figure 4.12 displays a significant effect ($p < 0.001$). As can be seen in Figure 4.12, the F0 increased more when it was focused or shortly after the focus.

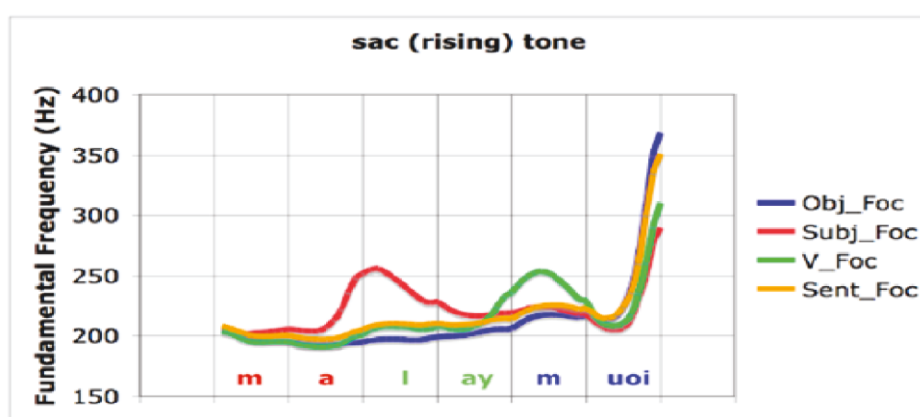


Figure 4.12 F0 contour of a sentence where all words have the rising tone, from Jannedy 2008, p. 13

The vowel of the subject under subject focus and the vowel of the object in object focus position are both significantly ($p < 0.001$) longer.

When it comes to the falling tone (*huyền*), there was hardly any variation of F0. The duration of the vowels of the subject in the subject focus position, and the duration of the vowel in verb focus position are all significantly longer ($p < 0.001$).

In sum, Jannedy (2008) has shown that focus in Vietnamese is marked by lengthening, as well as by intonation (especially with the the rising tone (*sắc*)). In the experiments in Chapter 5, Jannedy (2008) can be confirmed: Vietnamese displays final lengthening effects, as well as intonation effects with the rising tone (*sắc*). Note that discontinuous noun phrases also involve focus.

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Brunelle (2017) analyses disyllabic loan words under corrective focus. All of the target words displayed effects of final lengthening. However, F0 rising was found with the level tone (*ngang*) and the rising tone (*sắ́c*) for 7 out of 10 speakers.

Again, final lengthening effects, as well as intonation effects with the rising tone (*sắ́c*), are found in the experiments in Chapter 5.

4.5 Conclusion

In this chapter, a variety of different studies on intonation effects in Vietnamese was presented. Some of the studies involved discourse markers and different communicative functions in general (Section 4.4.3). Intonational effects in these contexts are not so surprising since lexical tones have a low functional load in these contexts (cf. Brunelle 2016). Still, these studies show that Vietnamese tones are rather flexible with regard to special communicative situations.

Vietnamese may show intonation by means of final lengthening and variations in (some) lexical tones. However, the effects were rather small so that none of the authors argued for a boundary tone (see also Brunelle 2016). Furthermore, Vietnamese only displays effects of tonal coarticulation, but no systematic tone sandhi (see Section 4.4.1 and 4.4.2).

As can be seen from the contributions of several authors, there is much debate about the prosodic hierarchy in Vietnamese (see Section 4.2). The proposal by Schiering et al. (2010) that Vietnamese does not possess a prosodic word does not seem tenable considering counter-arguments and my own proposal of the prosodic hierarchy, which takes reduplications as well as loan words into account (see Section 4.2.2). Furthermore, assuming the absence of prosodic words leads to questioning the grammatical word. This is very problematic since no theory of grammar does without words.

The experiments in the following chapter show that there are intonation effects in Vietnamese and thus provides evidence for the prosodic phrase.

Chapter 5 Empirical studies on the prosody of discontinuous NPs in Vietnamese

5.1 Introduction to the first and second experiments

The following two experiments were designed to analyse Vietnamese noun phrases in two different conditions, namely continuous and discontinuous noun phrases. The main research question was whether there are intonation effects distinguishing continuous from discontinuous NPs. It was found that there are such effects and these can be linked back to prosodic phrasing: The duration of a noun or classifier at the prosodic phrase boundary was significantly longer in phrase-final position compared to phrase-internal position. Furthermore, the rising tone (*sắ́c*) is articulated as clearly rising in phrase-final position, whereas it may lose its rising structure in phrase-internal position.

The first experiment was done with speakers of the Northern dialect and the second experiment with speakers of the Southern dialect. After the first experiment on the Northern dialect was successfully conducted and F0 variation was found with the rising tone (*sắ́c*), I wanted to analyse the variation of lexical tone in Vietnamese in more detail. However, in the Northern dialect some tones are glottalized, which makes it difficult to analyse F0 contours. Therefore, I decided to conduct a second experiment with speakers of the Southern dialect. The Southern dialect is described as a variety without glottalization in the literature (cf. Đỗ et al. 1998, Brunelle 2009, Vũ 1981) which makes it easier to analyse intonation. However, when analysing the Southern Vietnamese data, I also found glottalization on some tones. Therefore, I finally decided to only analyse the Southern Vietnamese non-glottalized tones. This was done by using the *Praat* (Boersma & Weenink 2018) script *Prosody Pro* by Xu (2013).

This chapter will be structured in the following way: The hypothesis for the first and second experiments will be presented (Section 5.2). In the next section, the first experiment will be discussed (Section 5.3) Third, the second experiment will be shown (Section 5.4), and finally conclusions will be drawn from the two experiments (Section 5.5).

5.2 Hypothesis for the first and second experiment

The main hypothesis for the first and second experiment are that the syntactic structures of discontinuous, continuous and control sentences are reflected in the prosodic

structures. Furthermore, correlates of the prosodic structures like duration effects and alternation of lexical tones are expected at the prosodic boundaries.

The general assumption is that in Vietnamese there is a direct mapping from syntax to prosody as in Nespor & Vogel (1986) and Selkirk (2011).¹ Following Match theory (Selkirk 2011) every syntactic clause is matched by an intonational phrase (ι) and every syntactic phrase is matched by a prosodic phrase (Φ).

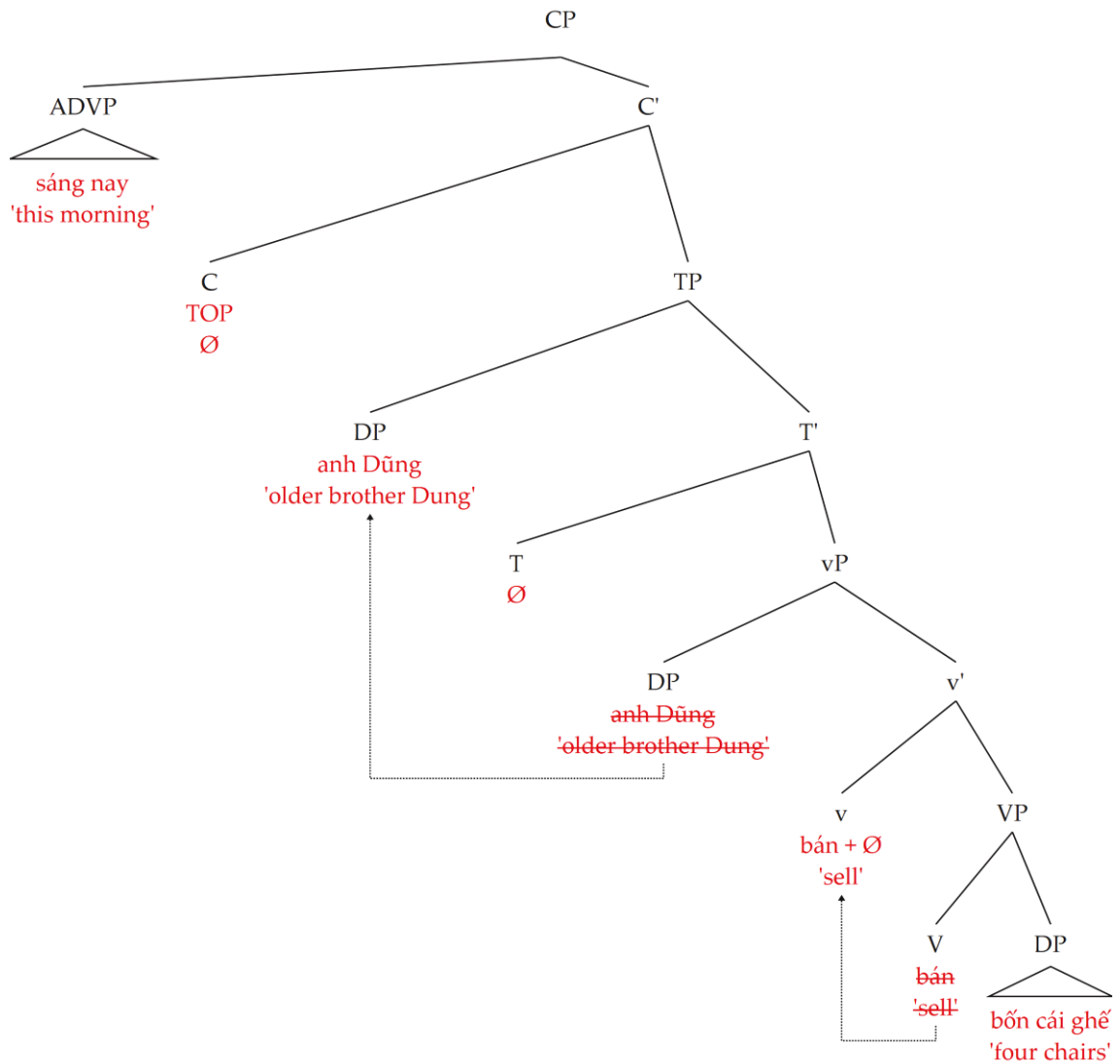
The prosodic structures of the different types of target sentences will be presented below (Examples (1) – (4)). Furthermore, the simplified syntactic structures will be given. Note that the target sentences are taken from the first experiment (All target sentences of the first experiment are listed in the appendix.) However, the same prosodic structure is assumed for both experiments. Therefore, the prosodic structure below is easily transferable to the second experiment, as well.

In 1a. the prosodic structure of a sentence containing continuous noun phrases is shown, in 1(b) it's corresponding syntactic structure is shown.

- (1) a. ((Sáng nay)_Φ (anh Dũng)_Φ (bán bốn cái ghế)_Φ
 ((this morning)_Φ (older brother Dung)_Φ (sell four CLF chair)_Φ
 (ba cái rổ)_Φ (và sáu cái gương)_Φ)_ι
 (three CLF basket)_Φ (and six CLF mirror)_Φ)_ι

¹ See also Brunelle (2016) for this view.

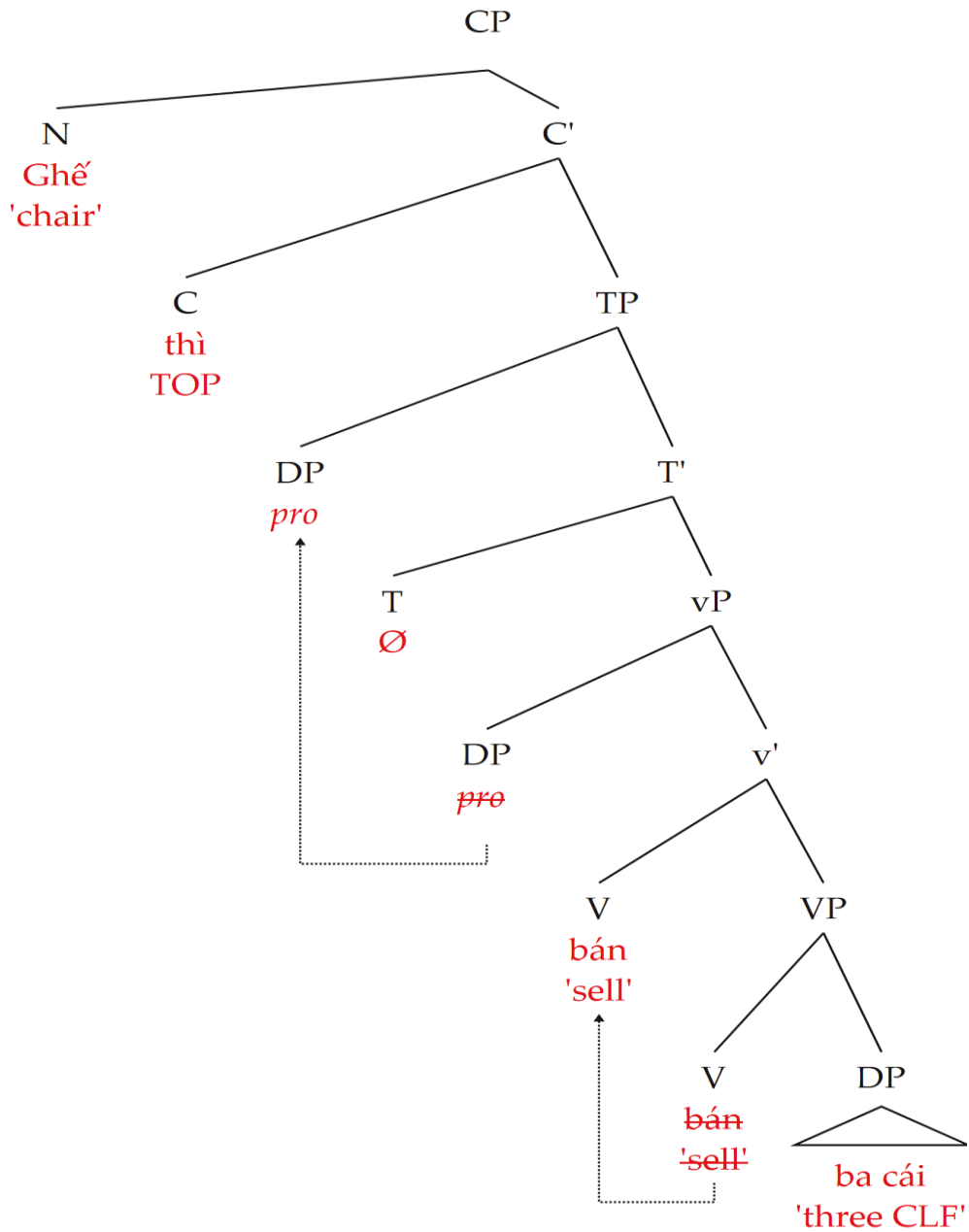
b.



-Sentence type 2: Sentences containing discontinuous noun phrases

- (2) a. ((Ghế thì)_φ (bán bốn cái)_φ)_ι, ((rổ thì)_φ (bán
 (chair TOP)_φ (sell four CLF)_φ)_ι, ((basket TOP)_φ (sell
 sáu cái)_φ)_ι (và (gương thì bán ba cái)_φ)_ι
 six CLF)_φ)_ι (and (mirror TOP sell three CLF)_φ)_ι

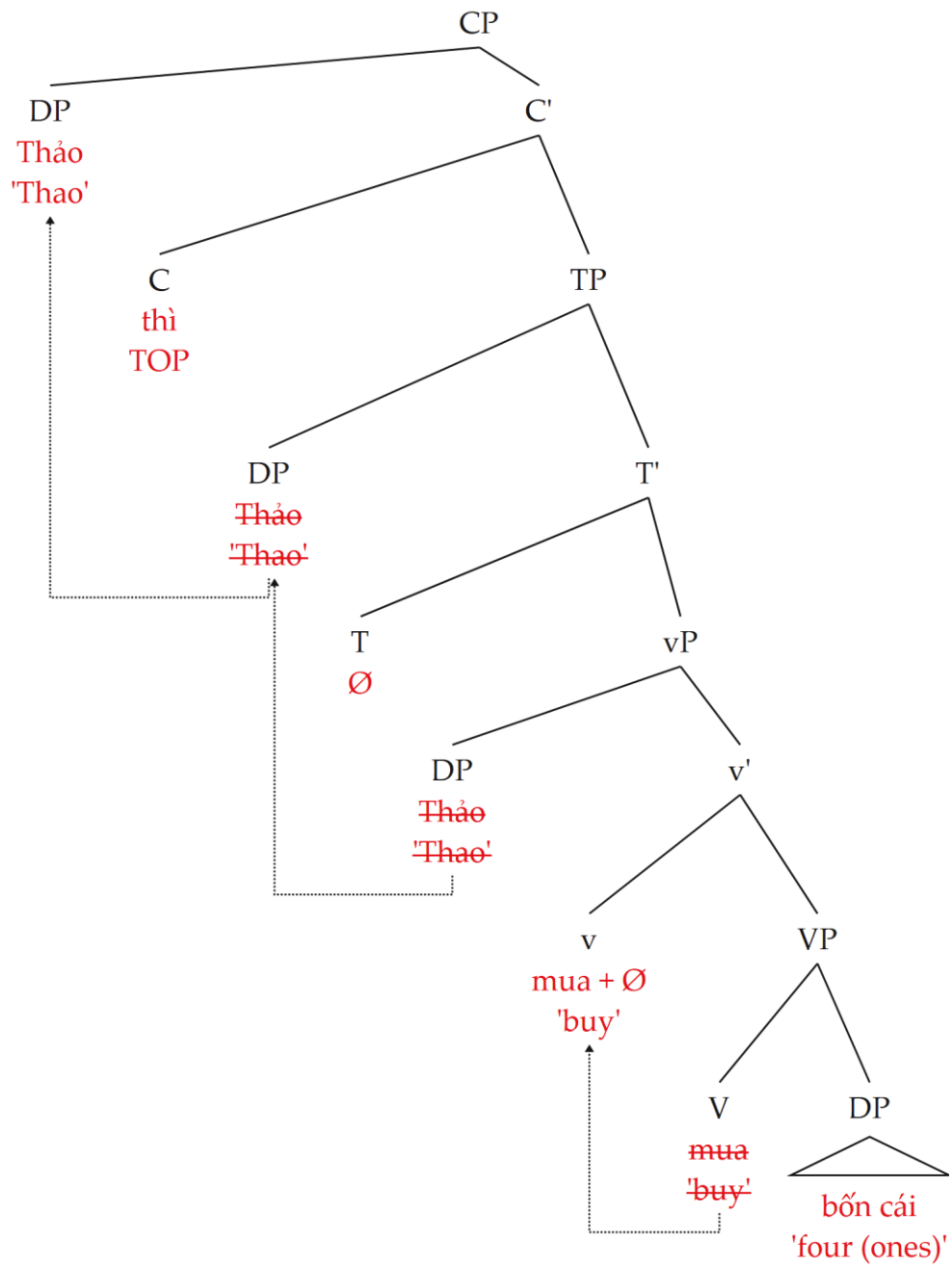
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-Sentence type 3: Sentences containing continuous noun phrases where the classifier functions as a pronoun

- (3) a. ((Thảo thì)_φ (mua bốn cái)_φ)_t ((Lý thì)_φ (mua ba cái)_φ)_t
 ((Thảo TOP)_φ(buy four CLF)_φ)_t ((Lý TOP)_φ(buy three CLF)_φ)_t
 (và (Mai thì)_φ (mua sáu cái)_φ)_t
 (and (Mai TOP)_φ (buy six CLF)_φ)_t

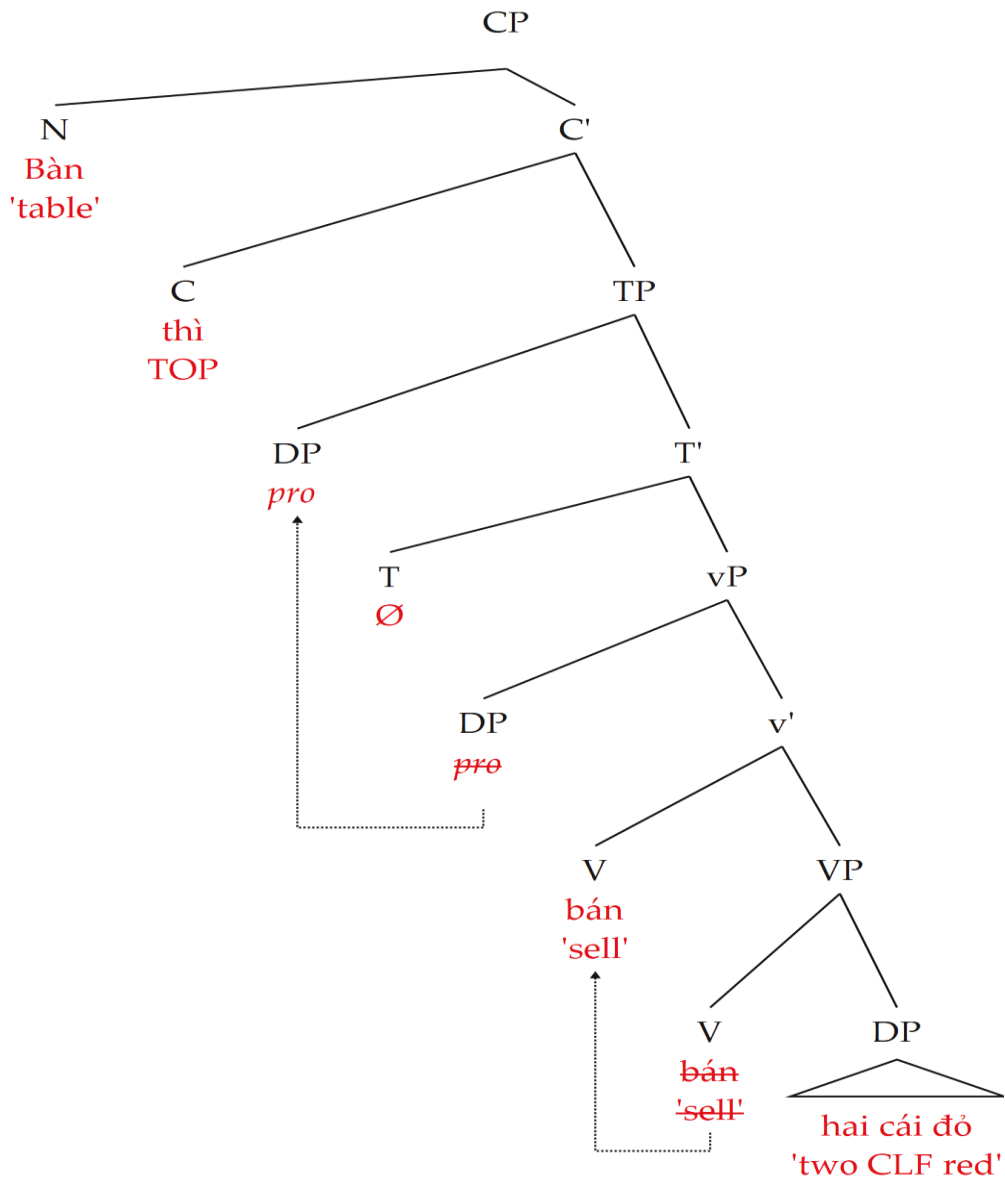
b.



-Sentence type 4: Sentences containing discontinuous noun phrases with an adjective after the classifier (prosodic phrases move further to the right)

- (4) a. ((Bàn thì)_ϕ (bán hai cái đồ)_ϕ (và ba cái
 ((table TOP)_ϕ (sell two CLF red)_ϕ (and three CLF
 vàng)_ϕ)_t ((gương thì)_ϕ (bán bốn cái vàng)_ϕ (và hai
 yellow)_ϕ)_t ((mirror TOP)_ϕ (sell four CLF yellow)_ϕ (and two
 cái xanh)_ϕ)_t (và ghế thì)_ϕ (bán ba cái vàng)_ϕ
 CLF green/blue)_ϕ)_t (and chair TOP)_ϕ (sell three CLF yellow)_ϕ
 (và chín cái đồ)_ϕ)_t
 (and nine CLF red)_ϕ)_t

b.



This assumption leads to the prediction that there have to be correlates of prosodic boundaries: namely, words at the prosodic boundary are more prominent than words that occur prosodic phrase-internally. Possible correlates are final lengthening effects (cf. for example Jannedy 2008, Brunelle 2017), as well as F0 variation. Therefore, the hypothesis for both experiments is that words at the prosodic boundary are more prominent than words that occur prosodic phrase-internally.

5.3 First experiment²

5.3.1 *Structure and general information of the first experiment*

The first experiment was done in order to test how participants react in general in a test of comparing continuous to discontinuous noun phrases in Vietnamese since no studies on this exist. Therefore, this experiment had a rather exploratory purpose.

The participants were 5 native speakers of Vietnamese (Hanoi dialect) who have lived in Germany no longer than two years. Two of the speakers were female and three of the speakers were male. They were between 21 and 27 years old and came to Germany for their studies. First, the subjects were exposed to a context by audio and visual means: they saw, heard and read a context sentence and looked at a context picture. The context picture was a picture visualizing the situation, which the participants heard and read. When the context was about a child loving animals, for example, a picture of a girl and a dog was shown. In a second step, the participants had to read the target sentences aloud. The target sentences were constructed in four different ways:

1. Sentences containing continuous noun phrases
2. Sentences containing discontinuous noun phrases
3. Sentences containing continuous noun phrases where the classifier functions as a pronoun
4. Sentences containing discontinuous noun phrases with an added adjective after the classifier (prosodic phrases boundary moves further to the right)

Pitch and duration were analysed on words containing the rising tone (*sắc*), namely the noun *ghế* ‘chair’ and the classifier *cái*. Since Vietnamese is a tone language intonation effects could be specific to a certain lexical tone, therefore for reasons of simplification only the rising tone occurred with the target words. Both target words are open syllables,

² Note that the main findings of this experiment were published in Duong Phu (2016).

which makes it easier to analyse the F0 contour. F0 can only be made visible when voicing is involved, therefore the spectrogram shows the F0 clearly with open syllables.

The following table shows the number of test items used in the first experiment:

condition	Classifier <i>cái</i> - rising tone	Noun <i>ghế</i> - rising tone
Continuous	9	3
Discontinuous no added material	9	
Discontinuous + added adjective after classifier	6	
Classifier as pronoun	9	

Table 5.1 Number of test items used in the first experiment

5.3.2 Target sentences

As mentioned earlier noun *ghế* ‘chair’ and the classifier *cái* were the test items of this experiment. Therefore, they are printed in **bold** and *italic*.

1. Sentences containing continuous noun phrases

The first set of sentences was presented in a context eliciting wide focus.

(5) Context: What happened?

Sáng nay anh Dũng bán bốn ***cái*** ***ghế***, ba
 this morning older brother Dung sell four CLF chair three
cái ***rổ*** và sáu ***cái*** gương.
 CLF basket and six CLF mirror
 ‘This morning Dung sells/sold four chairs, three baskets and six mirrors.’

The schematic representation of (5) is presented in (6).

(6) Introductory part Num CLF N, Num CLF N and Num CLF N

Noun complexes containing *ghế* ‘chair’, *rổ* ‘basket’ and *gương* ‘mirror’ appeared in three different positions in a sentence. This means that the order in which the noun complexes occurred varied. Therefore, we find three different target sentences with three different

word orders of this type (for all three target sentences, see the appendix). This was done to find out whether the order of the sentence constituents had an effect. It could be possible to find prosodic effects at the sentence boundary, i.e. at an intonation phrase boundary, but not after each enumeration, i.e. at a regular prosodic phrase boundary.

2. Sentences containing discontinuous noun phrases

(7) Context: Dung works as a salesman. This morning he sells a lot of things:

Ghế thì bán bốn cái, rổ thì bán sáu cái và gương
 chair TOP sell four CLF basket TOP sell six CLF and mirror
 thì bán ba cái.
 TOP sell three CLF

‘He sells four chairs, six baskets and three mirrors.’

In (8) the schematic representation of (7) is shown:

(8) N TOP VP Num CLF, N TOP VP Num CLF and N TOP VP Num CLF³

Sentences containing discontinuous noun phrases were presented in a context eliciting contrastive topic and focus. Since there were several items of enumeration a clear contrast was created. *Ghế* ‘chair’, *rổ* ‘basket’ and *gương* ‘mirror’ appeared in three different positions. Therefore, we find three target sentences with three different word orders of this type (for all three target sentences see the appendix).

3. Sentences containing continuous noun phrases where the classifier functions as a pronoun

Comparing sentence (9) to its discontinuous counterpart (7), we see that it contains a name instead of a bare noun. Although the numeral-classifier complex looks similar in both cases, the classifier in (9) seems to work as a pronoun that refers back to its antecedent in the context sentence. Thus, the prosodic structure is the same as with discontinuous noun phrases. However, the name and the numeral-classifier complex are not connected to each other in that they share the same θ -roles.

³ N is the subject and NUM CLF constitute the object.

- (9) Context: There is a special offer on baskets this week, so everybody wants to buy them.

Thảo thì mua bốn cái, Lý thì mua ba cái và Mai thì
Thao TOP buy four CLF Ly TOP buy three CLF and Mai TOP
mua sáu cái.
buy six CLF

‘Thao buys four, Ly buys three and Mai buys six.’

The names Thảo, Lý and Mai occurred in three different word orders providing three target sentences of this type (for all three target sentences see the appendix).

4. Sentences containing discontinuous noun phrases with adjectives added after the classifier (prosodic phrases boundary moves further to the right)

The following sentence contained discontinuous NPs with adjectives added to the classifier *cái*. This was done to move the prosodic phrase boundary from the classifier further to the right, namely to the adjective. Thus, the prosodic behaviour of the classifier in different contexts could be compared.

- (10) Context: Dung works as a salesman. This morning he sells a lot of things of different colours.

Bàn thì bán hai cái đỏ và ba cái vàng, gương
table TOP sell two CLF red and three CLF yellow mirror
thì bán bốn cái vàng và hai cái xanh
TOP sell four CLF yellow and two CLF green/blue
và ghế thì bán ba cái vàng và chín cái đỏ.
and chair TOP sell three CLF yellow and nine CLF red

‘He sells two red and three yellow tables, four yellow and two green/blue mirrors and three yellow and nine red chairs.’

5.3.3 Results

In the following section, the results of the first experiment are being presented in detail. However, in order to have an overview on the main results, the major finds of this study are presented in Table 5.2:

Results first experiment
-final lengthening effects of classifiers and nouns at the prosodic phrase boundary
-rising tone has wider pitch range at the prosodic phrase boundary, compared to when it occurs prosodic phrase internally

Table 5.2

As shown above this experiment gives evidence that nouns and classifiers display final lengthening effects at the prosodic boundary. Furthermore, it is shown that the rising tone has wider pitch range at the prosodic phrase boundary, compared to when it occurs prosodic phrase internally.

In order to present my findings, first of all continuous (phrase-internal) and discontinuous (phrase-final) NPs are compared.

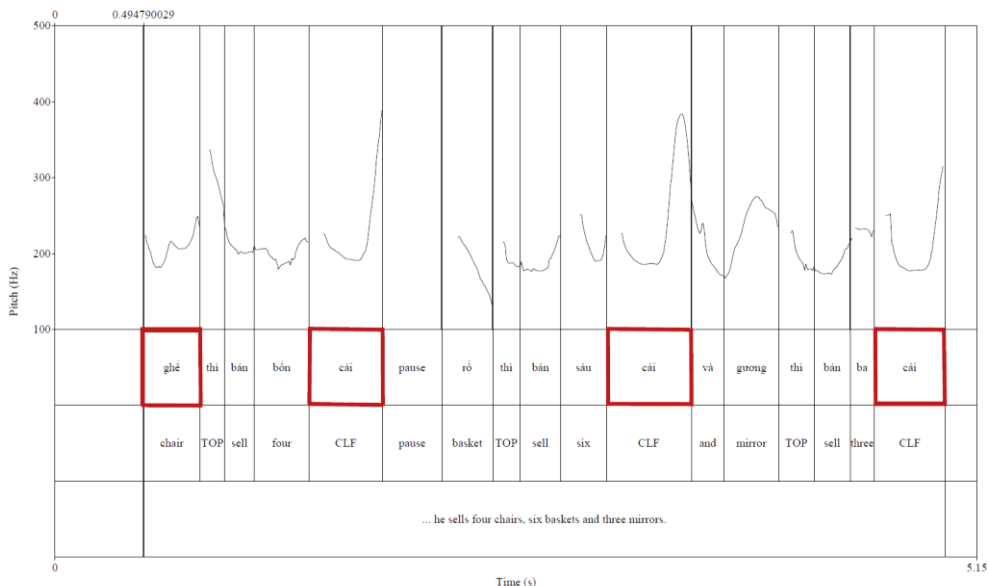


Figure 5.1 Example of intonation in the case of discontinuous noun phrases (female speaker)

Figure 5.1 shows the F0 variation of a female speaker where the classifier is in prosodic phrase-final position. The speaker's F0 of the classifier *cái* (rising tone) falls slightly in all of the occurrences and then rises clearly. The noun *ghế* 'chair' (rising tone) in the beginning displays a slight fall and then a small rising structure.

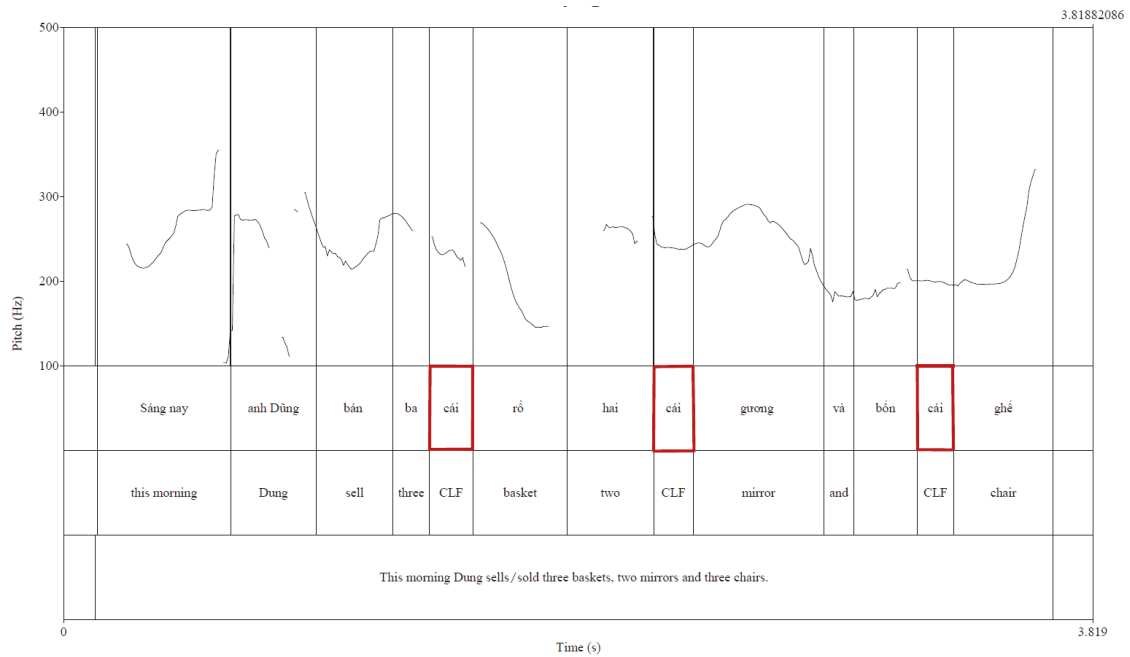


Figure 5.2 Example of intonation in the case of continuous noun phrases (female speaker)⁴

Figure 5.2 shows F0 with a continuous NP. In this case *cái* occurs prosodic phrase-internally. It is mostly produced with flat or even falling intonation. The noun *ghế* ‘chair’, which appears in phrase-final position, rises very clearly.

Figure 5.3 shows the duration of the classifier *cái* in continuous (phrase-internal) and discontinuous (phrase-final) cases. It turns out that the duration is significantly ($p < 0.001$) shorter in the continuous context.⁵ The mean duration of *cái* is 179 ms in the continuous and 393 ms in the discontinuous context (without added adjective). Thus, the mean duration of *cái* is more than twice as long in the discontinuous context compared to the continuous setting.

There is no significant difference in the duration of *cái* depending on its position in a sentence due to different word orders. In fact, such a difference was never found in any of the conditions.⁶ Thus, no special intonation phrase marking was found at the end of a sentence.

⁴ Note that the abrupt F0 variation on the name *Dũng* is due to glottalization.

⁵ This was tested with the help of a t-test calculated in Excel, $t = 5.1 * 10^{-30}$. The total number of target classifiers *cái* in discontinuous and continuous contexts was nine occurrences per speaker.

⁶ Tested with the help of an Anova calculated in Excel.

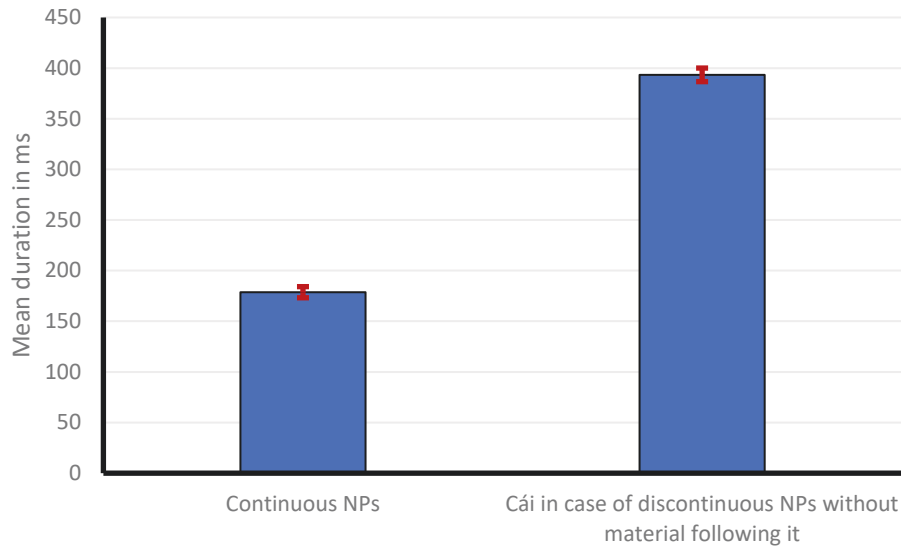


Figure 5.3 Mean duration of classifier *cái* in different conditions

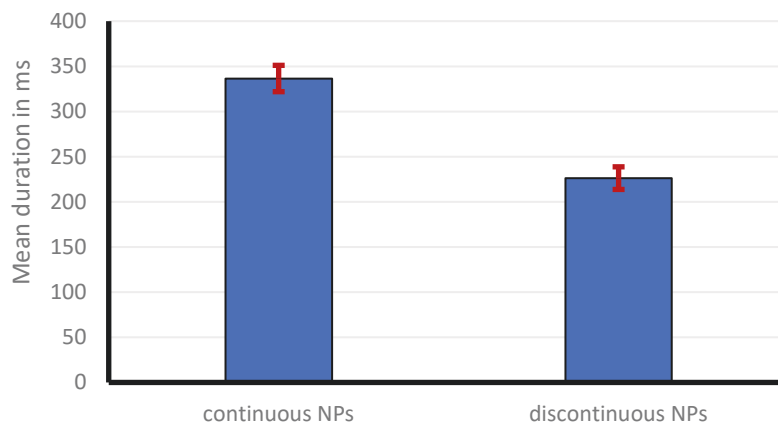


Figure 5.4 Mean duration of noun *ghế* 'chair' in different conditions

The noun *ghế* 'chair' is pronounced with significantly longer duration in the case of continuous NPs (about 337ms) and with significantly shorter duration in the case of discontinuous NPs (about 226 ms) ($p < 0.001$)⁷ as shown in Figure 5.4. Thus, the duration of the noun *ghế* 'chair' displays a completely opposite behaviour to that of the classifier *cái* (see Figure 5.3). The longer duration of *ghế* 'chair' also correlates with a very clear rising intonation (continuous context) whereas F0 rises only slightly when the duration is shorter (see Figure 5.1 and Figure 5.2).

⁷ Tested with the help of a t-test calculated in Excel, $t = 6,2 * 10^{-5}$. The total number of occurrences of *cái* as a pronoun was nine per speaker.

Chapter 5

When *cái* occurs as a discontinuous noun phrase with an added adjective, its pitch is mostly level or falling (see Figure 5.6). This is different from when there is no following material.

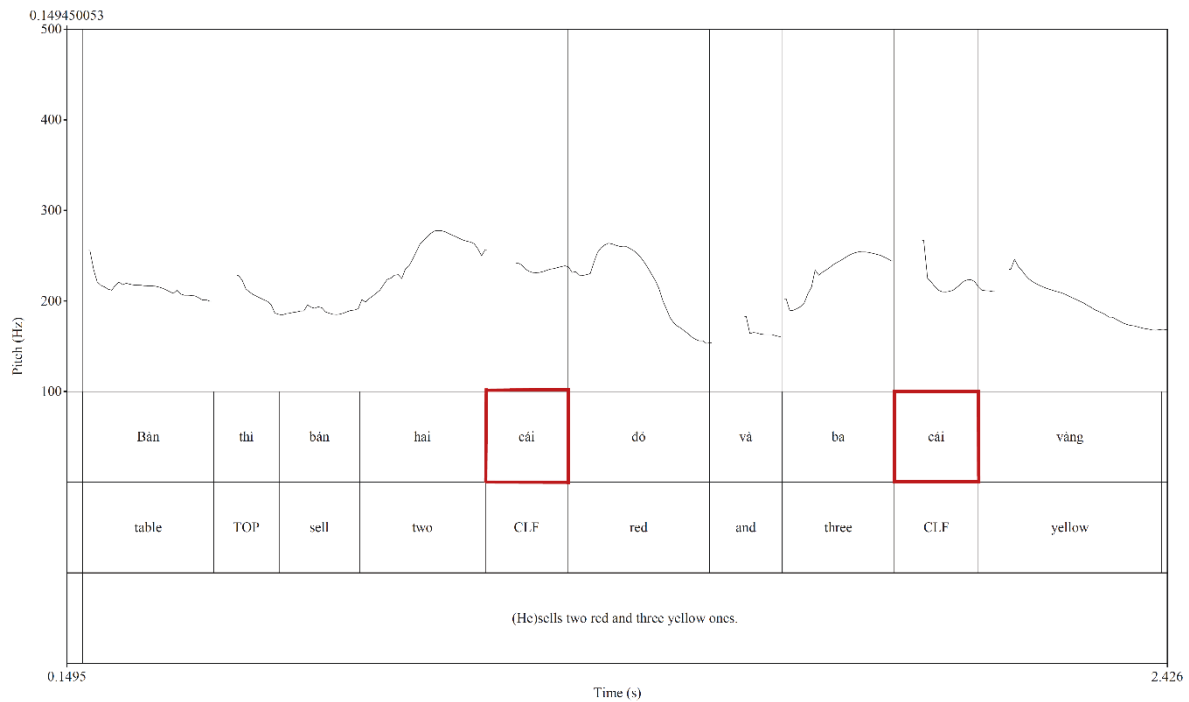


Figure 5.6 Example of intonation in the case of a discontinuous NPs with an adjective following *cái* (female speaker)

Furthermore, the duration of *cái* is significantly⁹ shorter when material follows, as shown in Figure 5.7. Again, the short duration correlates with the reduction of the rising tone in *cái*.

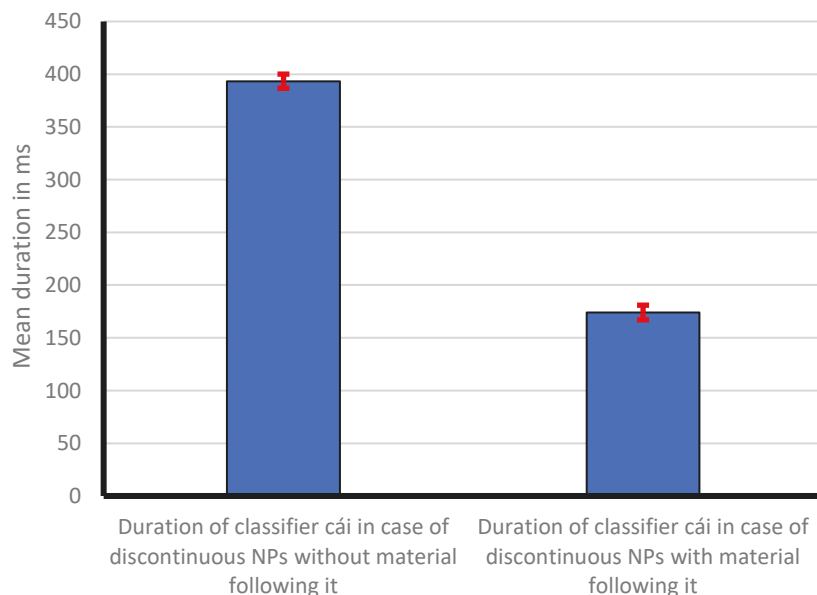


Figure 5.7 Mean duration of classifier *cái* in different conditions

⁹ Tested with the help of a t-test calculated in Excel, $p < 0.001$.

Overall, the first experiment shows that Vietnamese words (in this case one-syllabic classifiers and nouns) occurring at the prosodic boundary are more prominent compared to when they occur prosodic phrase internally. Correlates of this prominence are final lengthening effects as well as the rising tone being articulated as clearly rising. While the duration effects are very clear and proven statistically, the intonation effects merely rely on observations and are not normalized through speakers. This will be done with the data of the second experiment. Furthermore, this experiment only analysed F0 variation of the rising tone. In the second experiment, more tones were analysed. It was hoped that while analysing a non-glottalizing dialect, F0 could be analysed better.¹⁰

5.4 Second experiment¹¹

5.4.1 *Structure and general information on the study*

This read-speech experiment had 18 participants who grew up and lived in Ho-Chi-Minh City and its environs. The participants were aged between 16 and 44 years. The data of 6 female speakers out of the 18 participants were selected for analysis. Male speakers were excluded to better compare the speakers' F0 contours. Furthermore, some speakers who did not read fluently had to be eliminated.

During the experiment, participants read continuous, discontinuous and control sentences aloud after being exposed to a context. The context consisted of one or two introductory sentences on a screen. The context sentence was additionally presented acoustically (recordings of the context sentence/s by a female speaker of the same dialect). Furthermore, pictures accompanying the context were presented.

The target words, which were analysed in terms of duration and intonation, were classifiers. The following table gives an overview on the number of classifiers used for the second experiment. Note that the difference in number comparing the continuous to the discontinuous with no added material conditions as well as both discontinuous conditions were levelled out by statistical means and will be explained in detail in Section 5.4.4.2. Originally, also nouns were supposed to be analysed in detail, however due to a lack of time this topic was left for further research.

¹⁰ As mentioned earlier (see Section 5.1) the Southern dialect unexpectedly also shows glottalization with some of its tones.

¹¹ Note that the main findings of this experiment were published in Duong Phu (2018).

condition	<i>Con</i> - level tone	<i>Trái</i> – rising tone	<i>Cử</i> - curve tone	<i>Ngọn</i> – dropping tone	<i>Đàn</i> – falling tone
Continuous	5	5	5	5	3
Discontinuous no added material	10	10	10	10	6
Discontinuous + added adjective after classifier	6	6			

Table 5.3 Overview of the number of target words used for the second experiment¹²

Since Vietnamese is a tone language, intonation effects might be dependent on the target tone. In order to investigate the effects of lexical tones, sentences containing classifiers and nouns with the five different tones of the Southern dialect were constructed. To obtain clear F0 contours the target words were either open syllables or syllables closed with a nasal; thus, all sonorants. Non-target words in the sentences (except for introductory words or added adjective after the classifier) such as verbs or numerals contained only two different tones, namely the rising tone (*sắc*) and the level tone (*ngang*). This was done in order to minimize the possible influence of the adjacent tones on the target words.¹³

5.4.2 Target sentences

For a comprehensive overview on all the target sentences used in this experiment, see the appendix. This section explains the general structure of target sentences and the motivation behind their choice. Furthermore, some example target sentences will be given.

The test items (whose which were analysed in detail) were the classifiers therefore; they are always printed in **bold** and *italic*. Sentences containing discontinuous noun phrases were presented in a context eliciting contrastive topic and focus. All target sentences of this type had one of the following structures:

(11) N VP Num ***CLF***, N Num ***CLF***, and N TOP Num ***CLF***

(12) N VP Num ***CLF*** and N TOP Num ***CLF***

¹² The total number of target sentences is 30. All of the target sentences are listed in the appendix.

¹³ It might have been better to limit the number of tone to only one on non-target words, but this would have made the sentences less natural.

For all classifiers, except for classifier *đàn* there were two target sentences of type (11) as well as two target sentences of type (12). As for classifier *đàn*, type (11) occurred two times, whereas the sentences type (12) was not used.¹⁴

I decided to construct sentences containing enumerations of two or three items in order to make it clear that the nouns function as contrastive topics. There were five different kinds of target sentences each with a different classifier. Each classifier had a different tone. In addition, the nouns also varied in their tones.¹⁵ Note that in the second experiment the structure of the constituents was (11) or (12) and not (8) (repeated in (13)) as in the first experiment.

(13) N TOP VP Num *CLF*, N TOP VP Num *CLF* and N TOP VP Num *CLF*

The change of structure in the second experiment as compared to the first experiment was done on the advice of Vietnamese linguists¹⁶ before running the second experiment in Vietnam. The linguists also advised me to use the connective *còn* ‘and’ and not *và* ‘and’ since *còn* works better in connection with the topic marker. Thus, these constructions should make the target sentences sound more natural. Furthermore, the verb phrase only occurred in the first part of the enumeration; in the other parts there was an ellipsis of the verb phrase. The topic marker was deleted in the first and prospectively second part of the enumeration and only occurred in connection with *còn*. The target sentences contained three or two nouns each as in (14) and (15):

(14) Context: A (small) child likes animals a lot and wants to raise some different kinds of them.

Voi muốn nuôi sáu con, ngựa bốn con, còn gà thì ba
elephant want to raise six CLF horse four CLF and chicken TOP three
con.

CLF

‘S/he wants to raise six elephants, four horses and three chickens.’

¹⁴ This is due to the difficulty of finding nouns with different tones that can be used with *đàn*.

¹⁵ Note that the variation of the tones on the nouns was not analysed in this book. This analysis is left for further research.

¹⁶ Special thanks to Prof. Dũng Hoàng as well as to Mai Hoàng and her husband for all the support they gave me in constructing this experiment.

- (15) Context: A (small) child likes animals a lot and wants to raise some different kinds of them.

Chó muốn nuôi ba con, còn thỏ thì hai con.
 dog want to raise three CLF and rabbit TOP two CLF
 ‘S/he wants to raise three dogs and two rabbits.’

In order to test whether the position of the noun and classifier had an influence on intonation and duration, sentences with different constituent orders were tested. For each discontinuous target sentence, one sentence with a different constituent was constructed.¹⁷

For the classifier *đàn*¹⁸ ‘herd’ as in (16) it was difficult to find nouns consisting of all five tones to build appropriate sentences. Thus, only nouns with the curve (*hỏi*), falling (*huyền*) and level (*ngang*) tones were used. Since only these three nouns were used they could be integrated into a single sentence as seen in (16).

- (16) Context: This village has a lot of rabbits, sheep and buffalos.

Thỏ có năm đàn, cừu ba đàn còn trâu thì chín đàn.
 rabbit have five CLF sheep three CLF and buffalo TOP nine CLF
 ‘There are five herds of rabbits, three herds of sheep and nine herds of buffalos.’

Target sentences containing continuous noun phrases were presented in a context eliciting wide focus (participants read and heard the question “What happened?” in Vietnamese). The target sentences were grouped into five different types depending on the classifiers. In each sentence one classifier occurred two or three times. The classifiers varied in their tones (the five tones of Southern Vietnamese). In addition, nouns also varied in their tones.¹⁹ Therefore, there were ten target sentences: two sentences for each classifier.

The standard sentences with continuous noun phrases and no additional material had the structures (17) or (18).

- (17) Introductory part Num *CLF* N, Num *CLF* N and Num *CLF* N

- (18) Introductory part Num *CLF* N and Num *CLF* N

¹⁷ In the first experiment on the Northern dialect, it was shown that there is no difference in intonation depending on the different positions of the individual constituents. Therefore, in this experiment only one additional constituent order was tested even in cases of three elements of enumeration.

¹⁸ Note that *đàn* ‘herd’ is not a prototypical fully lexicalized classifier, but rather a lexeme that may function as a classifier in a wide sense. However, for the sake of this prosodic study the exact status of *đàn* is irrelevant.

¹⁹ Again, the different tones on the nouns are left for further research.

In (19) an example of a sentence with the structure (18) is shown. In order to show what the introductory part was like it is printed in bold:

(19) Context: What happened?

Một em bé muốn nuôi ba *con* chó và hai *con* thỏ.
one child small want to raise three CLF dog and two CLF rabbit
'A small child wants to raise three dogs and two rabbits.'

The content of the introductory part was used to make the continuous sentence a proper sentence, since it contained a subject and predicate, while the continuous noun phrases constituted the object. In the example in (19) the introductory part was *Một em bé muốn nuôi* 'A small child wants to raise ...'.

Sentences containing continuous noun phrases, which were prosodically comparable to discontinuous noun phrases (control sentences) were also tested: the sentence in (20) may be uttered in a context like *Có nhiều em bé muốn có con thỏ* 'There are many children who like to have rabbits.' In this context, the classifier *con* (+animate) of the target sentence functions as a pronoun referring back to *thỏ* 'rabbit'. Despite *con*'s function as pronoun, the phrase *muốn nuôi hai con* 'want to raise two' superficially has the same structure as in a discontinuous noun phrase. The first experiment showed that in this kind of structure the intonation and duration of the classifier and noun are similar to those in sentences with discontinuous noun phrases. I did not expect the Northern and Southern dialects to differ in this respect. Therefore, I only tested one sentence of this type, namely (20). It was not necessary to test a sentence like (20) with respect to different word orders.

(20) Context: There are many children who like to have rabbits:

Tý muốn nuôi hai *con*, Thảo ba *con*, còn Hồng thì chín *con*.
Ty want to raise two CLF Thao three CLF and Hong TOP nine CLF
'Ty wants to raise two, Thao three and Hong nine.'

Finally, sentences containing discontinuous noun phrases with adjectives added after the classifiers were recorded and analysed. In this case, the prosodic phrase boundary moves further to the right compared to the regular discontinuous noun phrases.

With the help of the following sentences, it was tested whether adding adjectives after the classifier in a sentence containing a discontinuous NP triggers the same intonational effects as without additional material. I assumed that the prosodic behaviour of the classifier would differ

when comparing examples in which the classifier constitutes a prosodic phrase boundary to cases in which the added adjective constitutes this boundary.

In examples (21) and (22), adjectives modify the prosodic phrase rendering the classifier non-final in its phrase, furthermore numerals occur before the classifier. The classifiers have the rising (*sắc*) and level (*ngang*) tones, while the adjectives involve the following tones: rising (*sắc*), level (*ngang*), curve (*hỏi*) and falling (*huyền*).

(21) Táo thì mua hai ***trái*** đỏ, sáu ***trái*** vàng, khế thì sáu ***trái***
 apple TOP buy two CLF red six CLF yellow carambola TOP six CLF
nhỏ ba ***trái*** to, còn cam thì bốn ***trái*** đỏ và chín ***trái***
 small three CLF big and orange TOP four CLF red and nine CLF
vàng.

yellow

‘She buys two red and six yellow apples, six small and three big carambolas, as well as four red and nine yellow oranges.’

(22) Chó thì muốn nuôi hai ***con*** lớn và ba ***con*** nhỏ, thỏ thì
 dog TOP want to raise two CLF big and three CLF small rabbit TOP
hai ***con*** nâu và ba ***con*** trắng còn mèo thì sáu ***con*** đen
 two, CLF brown and three CLF white and cat TOP six CLF black
và hai ***con*** xám.

and two CLF grey

‘He wants to raise two big and three small dogs, two brown and three white rabbits, and six black and two grey cats.’

In (21) the target classifier *trái* (rising tone) occurred six times and in (22) the classifier *con* (level tone) occurred six times as well.

5.4.3 Use of Prosody Pro (Xu 2013)

In the second experiment, F0 variation of classifier *con* (level tone - *ngang*), *trái* (rising tone - *sắc*) and *đàn* (falling tone - *huyền*) was shown. This was done by relating F0 to a normalized time. With this method, the different speaking paces of the individual speakers are normalized. In order to get F0 at a normalized time, the Praat (Boersma & Weenink 2018) script *Prosody Pro* by Xu (2013) was used. This script goes through all the items and calculates F0. In order to do this, intervocal pulses (intervocalic oscillation) are marked as can be seen from the purple parts in Figure 5.8. These pulses are then corrected manually.

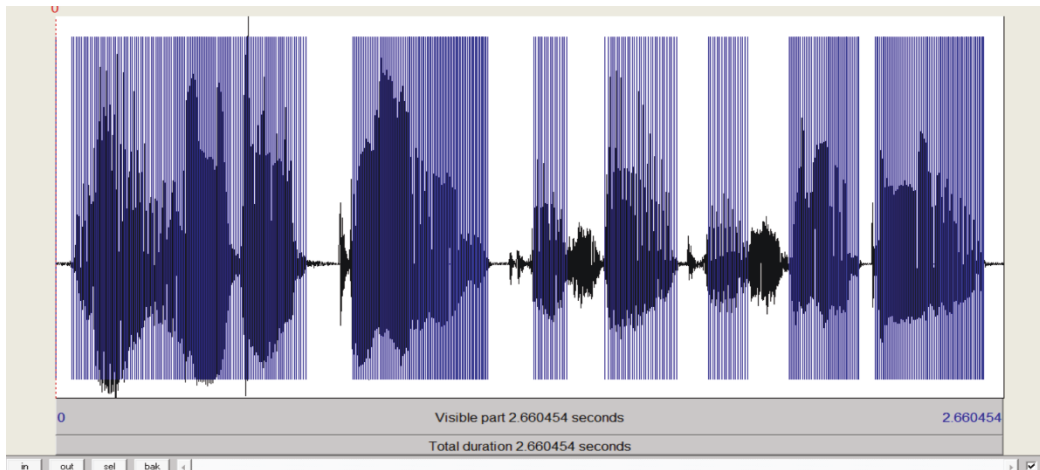


Figure 5.8 Automatic marking of intervocal pules

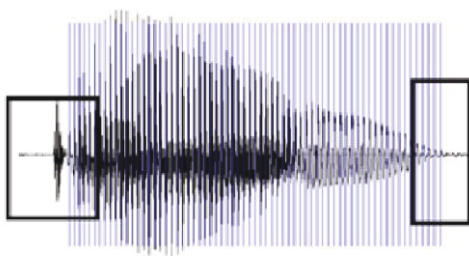


Figure 5.9 Automatic marking of intervocal pules, zoomed in

Figure 5.9 gives us a closer look at the automatically marking of pulses.²⁰ However, the pulses are also marked when the oscillation is not very regular therefore, no correct depiction of F0 is expected. This is pointed out with the help of the black boxes. In such cases, this was manually corrected as shown in the black boxes in Figure 5.10.

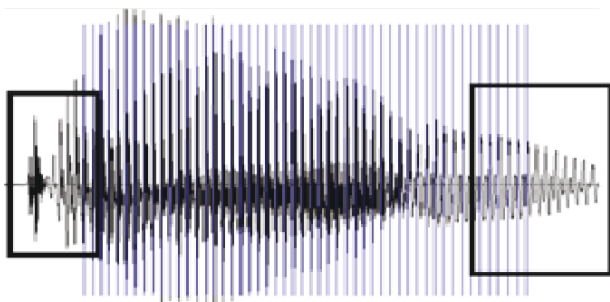


Figure 5.10 Automatic marking of intervocal pules, manual correction

5.4.4 Results

Before doing a detailed analysis of the results of this experiment, it is helpful to have an overview of the main results as well relating this experiment towards the first one. For this purpose, the following table (Table 5.4) has been made:

²⁰ Note that Figure 5.8 is not the same utterance as Figure 5.9 and Figure 5.10. However, Figure 5.9 and Figure 5.10 show the same utterance.

Results which can be confirmed from the experiment on the Northern dialect (1st experiment)
-final lengthening effects of classifiers at the prosodic phrase boundary
-rising tone has wider pitch range at the prosodic phrase boundary, compared to when it occurs prosodic phrase internally
New findings from the second experiment
-Southern dialect also displays glottalization
-falling tone, curve tone and dropping tone do not show intonational effects

Table 5.4 Main results of both experiments

As shown above, both experiments demonstrate that there are final lengthening effects of classifiers at the prosodic phrase boundary. The first experiment additionally showed this effect for nouns. However, I am assuming that Vietnamese generally displays final-lengthening effects independently of the type of word occurring in sentence final position.

Both experiments show that the rising tone has wider pitch range at the prosodic phrase boundary, compared to when it occurs prosodic phrase internally. The new findings of this experiment are that the Southern dialect also displays glottalization as well as that the falling tone, curve tone and dropping tone do not show intonational effects.

5.4.4.1 General observation: Glottalization in Southern Vietnamese

Kirby (2010) states: “While Northern Vietnamese tones are cued by a combination of pitch and voice quality, Southern Vietnamese tones are purely pitch based” (p. 3749). This opinion is shared by all authors (cf. Đỗ et al. 1998, Brunelle 2009, Vũ 1981). However, Kirby (2010) also writes that “SVN [Southern Vietnamese] speakers may mimic NVN [Northern Vietnamese] voice quality distinctions in certain situations, but colloquial SVN speech does not make contrastive use of distinctive voice quality.” (p. 3750). Since the Northern dialect is the prestigious dialect, this dialect may serve as a role model for Southern Vietnamese speakers. Andrea Hoa Phạm (personal communication) claims that in the Southern dialect glottalization may occur, but does not have a meaning-distinguishing function.

Still, no author has considered that glottalization in Southern Vietnamese occurs in a context where it does not in Northern Vietnamese. My findings suggest that glottalization in Southern Vietnamese occurs frequently with the curve tone (*hỏi*) as shown in Figure 5.11 which is an utterance of speaker 5 in phrase-final context. However, the classifier *củ* was not always glottalized. In Figure 5.12, produced by speaker 2, it is not. The question why this glottalization

occurs cannot be answered in this book. Still, one possible explanation is that it is an overgeneralization of the Northern Vietnamese broken tone (*ngã*), which is a glottalized tone (see Section 4.1 for a description of Vietnamese tones). In Southern Vietnamese, the broken tone (*ngã*) does not exist, but fuses with the curve tone (*hỏi*). Thus, in all cases where Northern Vietnamese speakers produce the broken tone (*ngã*), Southern Vietnamese speakers produce the curve tone (*hỏi*).

As can be seen from Figure 5.11, glottalization prevents the F0 from being correctly tracked since the pitch signal displays irregular pitch periods. Therefore, the curve tone (*hỏi*) was not included in the analysis.

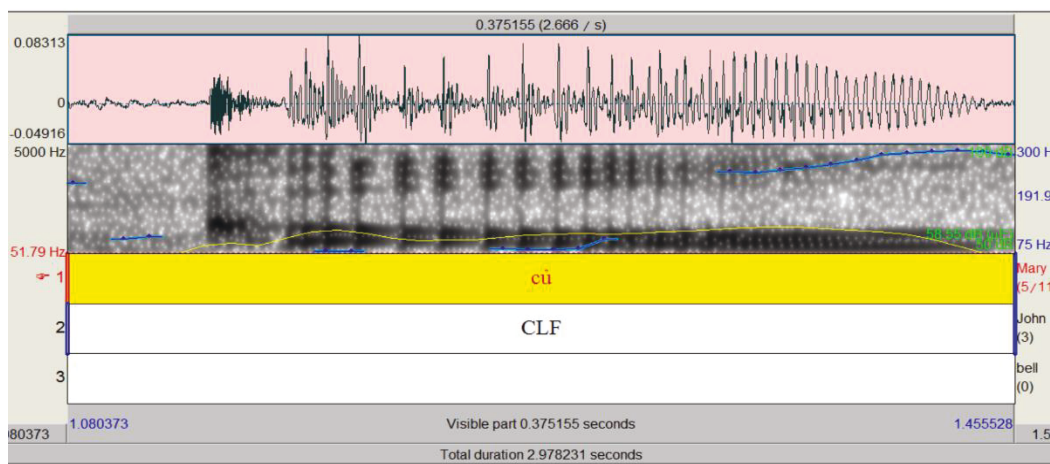


Figure 5.11 Glottalization of *củ* 'CLF' (curve tone)

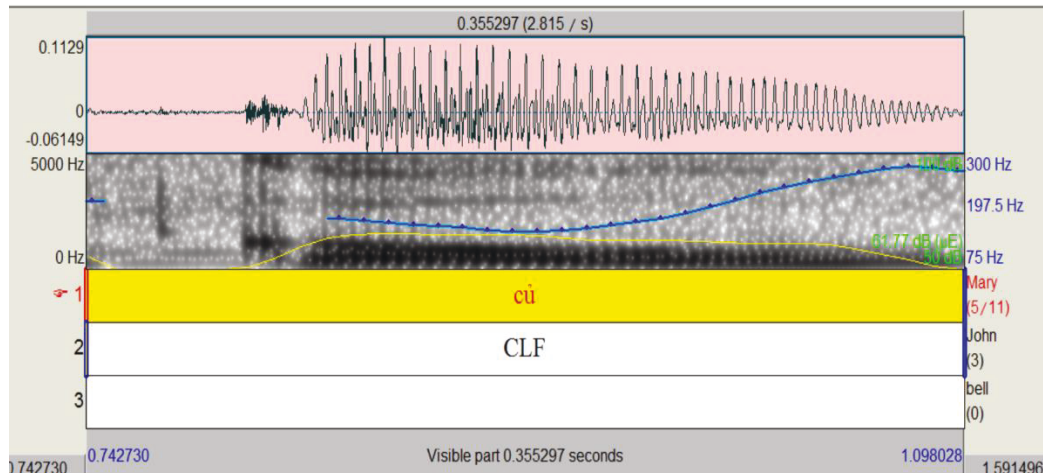


Figure 5.12 No glottalization of củ ‘CLF’ (curve tone)

As for the dropping tone (*nặng*), it also frequently occurred with glottalization as in Figure 5.13. However, as can be seen from Figure 5.14, glottalization does not always occur: The speech signal shows regular pitch periods.

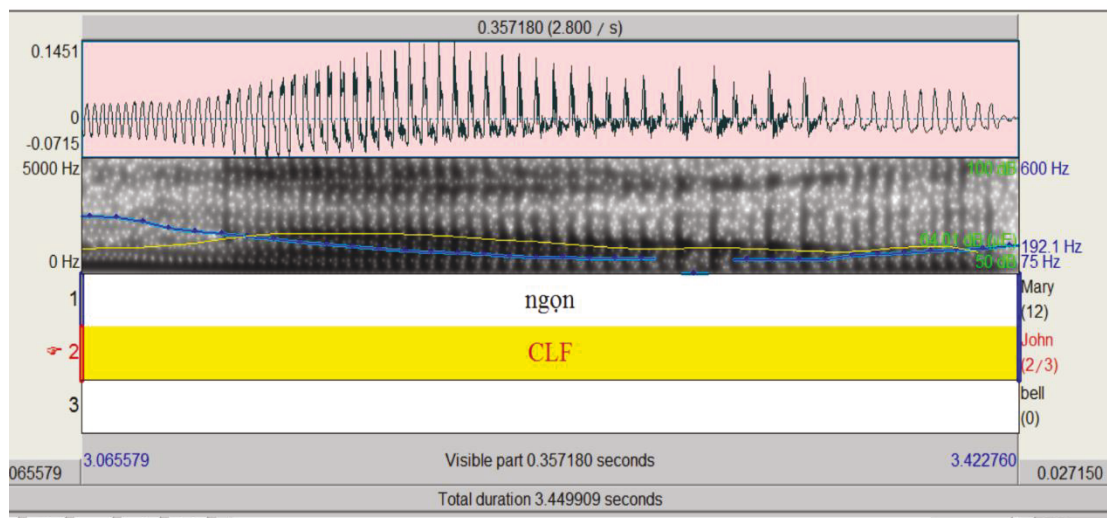


Figure 5.13 Glottalization of ngọn ‘CLF’ (curve tone)

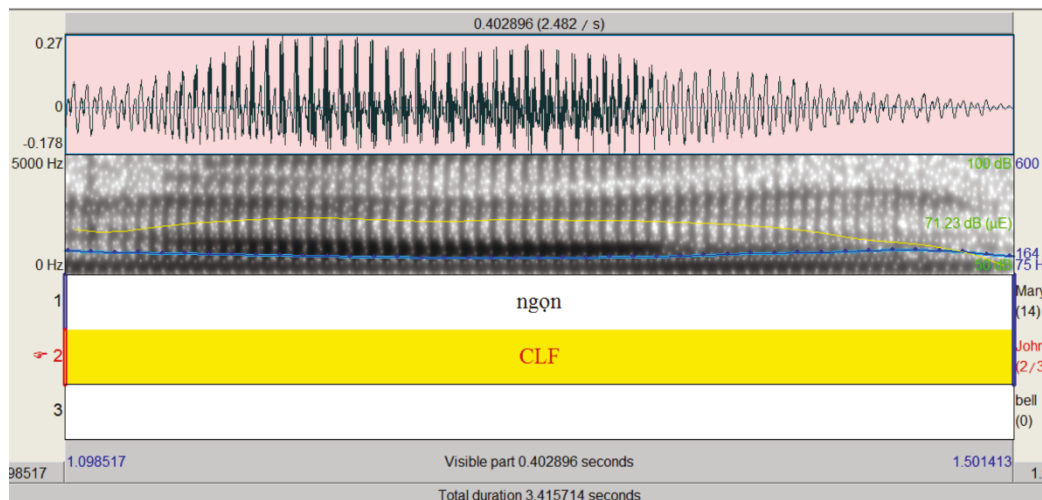


Figure 5.14 No glottalization of *ngon* 'CLF' (curve tone)

Because of the frequent glottalization of classifier *ngon* (dropping tone) and the difficulty of tracking the F0 variation via Praat (Boersma & Weenink 2018) (see Figure 5.13), *ngon* is not included within the pitch analysis.

5.4.4.2 Duration

One of the main results concerns duration effects in a comparison between discontinuous and continuous noun phrases. The first experiment showed very clear effects of duration. In the second experiment, similar results were obtained. The average duration of all classifiers is significantly longer in the case of discontinuous noun phrases than in continuous ones. This effect is a consequence of the fact that, in the discontinuous configuration, the classifier is final in its prosodic phrase, whereas it is phrase-medial in the continuous noun phrases. The following graph shows the mean duration of all classifiers in the continuous and discontinuous conditions. The overall mean duration was the mean duration calculated from all of the six female speakers.²¹

²¹ Each target sentence contained 3 or 2 classifiers (see Section 5.4.2). The number of the classifiers for each condition was not identical (they were 10 occurrences of the classifiers *con*, *trái*, *củ*, *ngon* in discontinuous context and 5 occurrences of these classifier in continuous context; *đàn* occurred 6 times in the discontinuous context and 3 times in the continuous context).

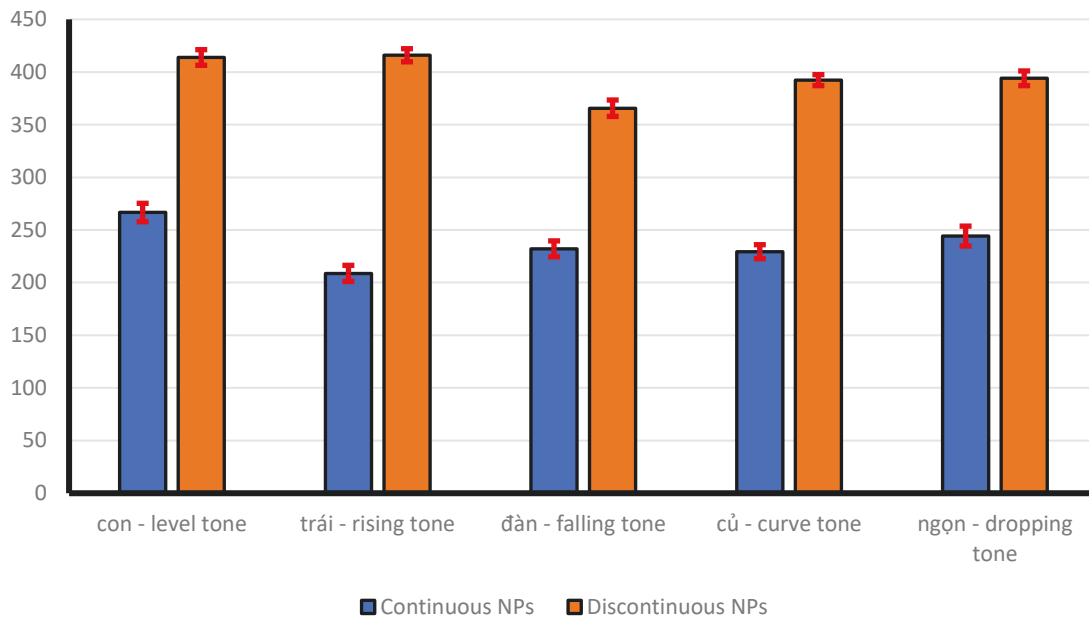


Figure 5.15 Mean duration of classifiers in continuous and discontinuous context

The differences between continuous and discontinuous NPs is highly significant. This is shown by a one-way ANOVA²² calculated in Microsoft Excel (2013). The significance level was $\alpha=0.05$. The p-value was always clearly below 0.01. The critical F-value and the F-value differed by more than 100 in each case.²³

For a better illustration of the different durations in the discontinuous and continuous contexts, the following graph (Figure 5.16) compares the different percentages for each classifier.

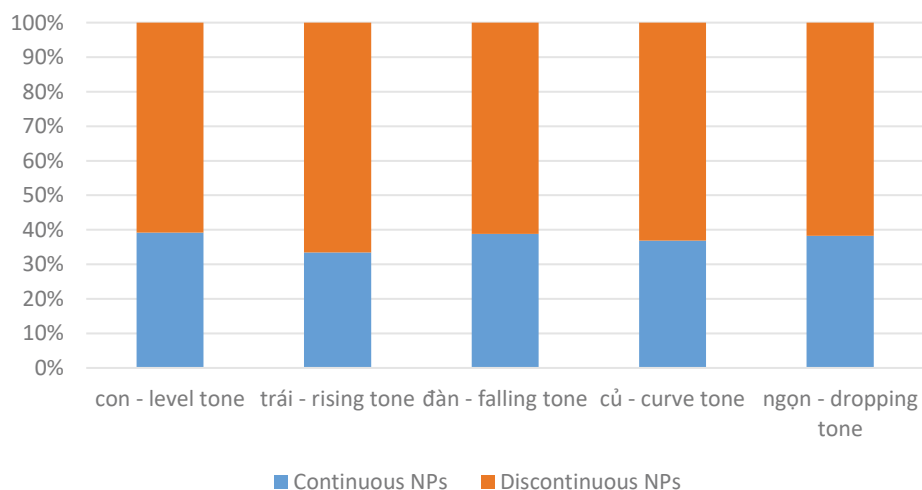


Figure 5.16 Mean duration of classifiers in continuous and discontinuous context

²² Short for “Analysis of Variance“.

²³ The F ratio shows “whether there is more variation between groups than within groups“ (Lomax & Hahs-Vaughn 2012, p. 301). If the F value is bigger than the critical F value, the null hypothesis is rejected. (cf. Lomax & Hahs-Vaughn 2012, p. 301).

For Figure 5.17 the durations of all classifiers in the two contexts were added together before the percentages were calculated. It can be seen that the classifiers in the continuous context are only slightly less than 40% of the duration of the classifiers in the discontinuous context.

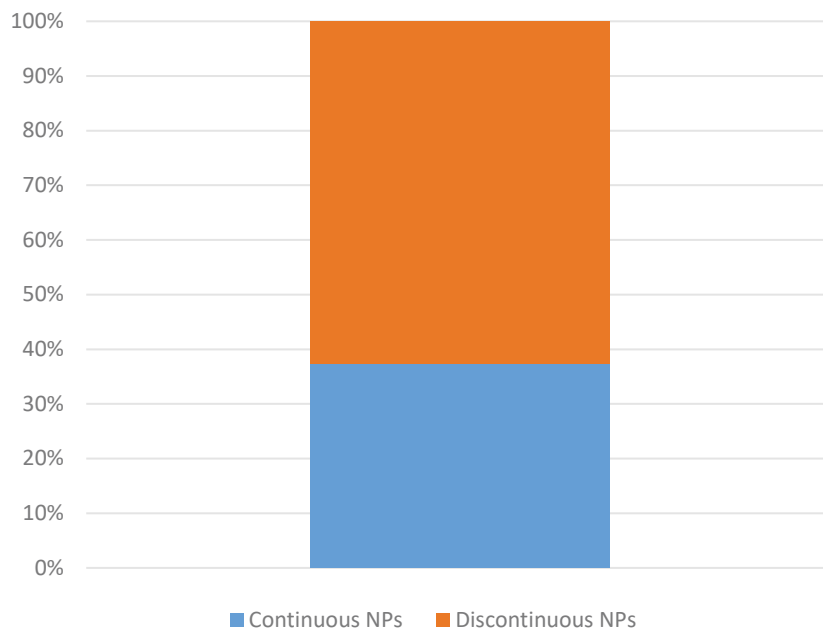


Figure 5.17 Mean duration of all classifiers in continuous and discontinuous context

When the phrasing is changed, and the classifiers are not final in their prosodic phrases, the duration of the classifier is clearly shorter, as illustrated in Figure 5.18: the average duration of the classifier *con* in the discontinuous context with no added material after the classifier is 414 ms, whereas the duration of the discontinuous noun phrase with added material is 243 ms. Using a t-test assuming unequal variance,²⁴ it turned out that the longer duration of *con* in the discontinuous context without added material was very significant. The p-value (one-way t-test) was $1.4 * 10^{-28}$. Although there is a significant effect between the duration of *con* in discontinuous noun phrases with added material and in the continuous context (two-way t-test $p=0.04$), this effect is minimal compared to the large difference between the discontinuous context with and without added material.

²⁴ This was done since the number of classifiers analysed was different in each of the conditions. Adding up the durations of the five different speakers, there were 60 items for the discontinuous context with no added material, 36 items for the discontinuous context with added material after the classifier and 30 items for the continuous context.

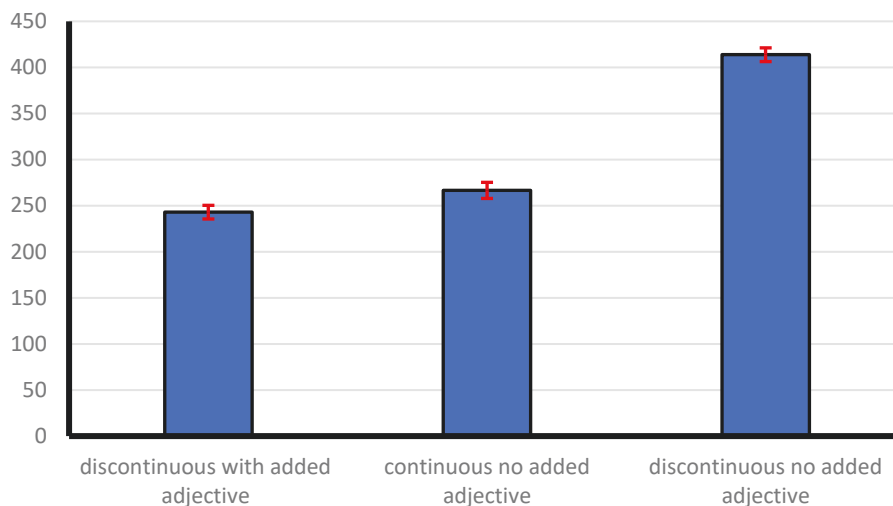


Figure 5.18 Mean duration of classifier *con* (level tone) in different contexts

The following graph shows the average duration of the classifier *trái* (classifier for fruits) in the case of discontinuous noun phrases with and without added adjective, as well as in the continuous context. *Trái* in the discontinuous context with no added adjective is 416 ms long whereas in the continuous context (without added adjective) the average duration is almost half of this: 213 ms. This difference was also large from a statistical point of view: the p-value (one-way t-test) was $3.4 \cdot 10^{-41}$. The mean duration in the continuous context is 209 ms, which is only slightly smaller than in the discontinuous context with added adjective: this difference is not significant.

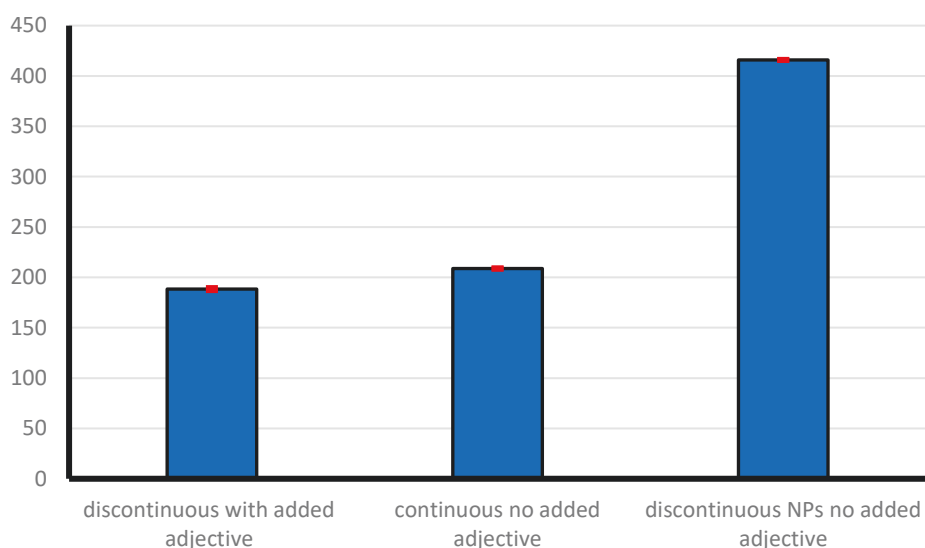


Figure 5.19 Mean duration of classifier *trái* (rising tone) in different contexts

The length of discontinuous noun phrases is not equivalent as seen in the sentence structure (17) and (18) repeated in (23) and (24). In (23), the noun of the first discontinuous noun phrase is followed by a verb phrase, after the verb phrase the numeral and classifier occur. The noun

of the second discontinuous noun phrase, is directly followed by the numeral-classifier complex. Afterwards ‘and’ introduces the third discontinuous noun phrase. The noun of the third discontinuous noun phrase, is followed by the topic marker then the numeral and classifier occur. (24) has a similar structure except that the second discontinuous noun phrase is missing.

(23) N VP Num *CLF*, N Num *CLF*, and N TOP Num *CLF*

(24) N VP Num *CLF* and N TOP Num *CLF*

These different lengths have led to assume that there might be micro-prosodic effects when comparing discontinuous noun phrases at different positions in the sentence. Micro-prosodic effects are “non-intentional segmental influences on duration, fundamental frequency and amplitude” (Winkelmann 2009).

Such effects were found, again with the help of a one-way ANOVA calculated in Microsoft Excel (2013) comparing the duration of the classifiers of sentences containing three different discontinuous noun phrases (sentence structure in (24)). There were two target sentences for each classifier (*con*, *đàn*, *trái*, *củ* and *ngon*). The duration of each classifier at a certain position by one speaker was added to the durations of the other 4 speakers. The ANOVA showed that there was a significant difference between the three locations of the classifier *con*, *trái*, *đàn* and *củ* in the sentence. For the sentence containing classifier *con*, the F-value was 4.5, which is higher than the critical F-value with 3.3. The difference between the F-value and the critical F-value was therefore 1.2 and the p-value was 0.018 ($p < 0.05$). As for *trái* the F-value was 5.9 while the critical F-value was 3.3 (the difference between the two values was thus 2.6). The p-value was 0,006 ($p < 0.01$). For *đàn* one value was missing due to problems with the recordings, therefore the missing value was replaced by the mean. The F-value was 6.3 and the critical F-value was 3.3. Therefore, the F-value was greater by 3. The p-value was 0,005 ($p < 0.01$). Sentences containing the classifier *củ* showed the following ANOVA results: the F-value was 5.9 and the critical F-value was 3.3 thus the F-value was bigger by 2.6. The p-value was 0.004 ($p < 0.01$).

For the classifier *ngon* no significant effects were found. However, although we find significant, or with the classifiers *đàn*, *trái* and *củ* even highly significant ($p < 0.01$), differences, the results are not so clear compared to the difference we find comparing discontinuous to continuous noun phrases. Remember that for these cases the F-value was higher by at least 100 compared to the critical F-value. Therefore, this small difference does not influence other parts of the duration analysis.

In the following graph, we see that for each classifier the longest duration is found in the first position. It decreases in the second position and is even shorter in the third position:

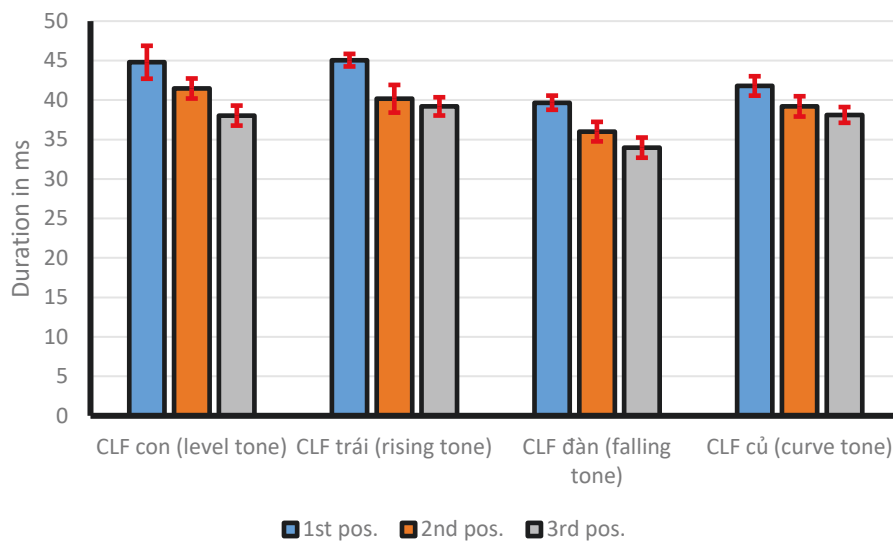


Figure 5.20 Duration of classifiers in different positions

Just as in the first experiment the last classifier, which also constitutes the last word in the sentence, is not the longest. This leads to assume that we do not find a special marking of the intonation phrase here. The last word of the each enumeration is the prosodic phrase. There is no evidence for an additional prosodic making of the intonational phrase in this experiment.

During my research on discontinuous noun phrases in Vietnamese, I was often asked whether the intonation effects I found comparing continuous to discontinuous constructions were also present in other constructions. The answer is yes, phrase-final lengthening, for example, also occurred in other contexts.²⁵ The target sentence in (25) (repetition of (20)) is superficially comparable to a discontinuous target sentence. However, a proper name occurs at the beginning of each of the different parts of the enumeration. At the end of each part of the sentence, there was a numeral-classifier complex. In this context, the classifier functions as a pronoun referring back to the noun *thỏ* ‘rabbit’ in the context. As illustrated in (25), the classifier *con* occurred three times in each sentence. Since this target sentence was uttered by all six speakers, it occurred 18 times all together. The duration of *con* in this context was compared to the duration of the same classifier in the discontinuous context (see, example (14)). The results of this comparison are shown in Figure 5.21. The mean duration of phrase-final (not discontinuous) *con* was about 426 ms, whereas the mean duration of phrase-final (discontinuous) *con* was

²⁵ As far as I know, there is no language that displays a ‘special’ intonation for discontinuous noun phrases only (Caroline Féry, personal communication).

about 414 ms. Doing an ANOVA, I found that there was no significant difference between the two contexts ($p > 0.05$). However, there was a significant difference between the mean duration of *con* in (25) and when it was part of a phrase-internal (continuous) noun phrase (ANOVA $p < 0.001$, 267 ms). This shows that classifiers or other monosyllabic words are generally longer at the prosodic phrase boundary compared to when they occur prosodic phrase-internally.

(25) Context: Children want to raise rabbits.

Tý muốn nuôi hai **con**, Thảo ba **con**, còn Hồng thì chín **con**.
 Ty want to raise two CLF Thao three CLF and Hong TOP nine CLF
 ‘Ty wants to raise two, Thao three and Hong nine.’

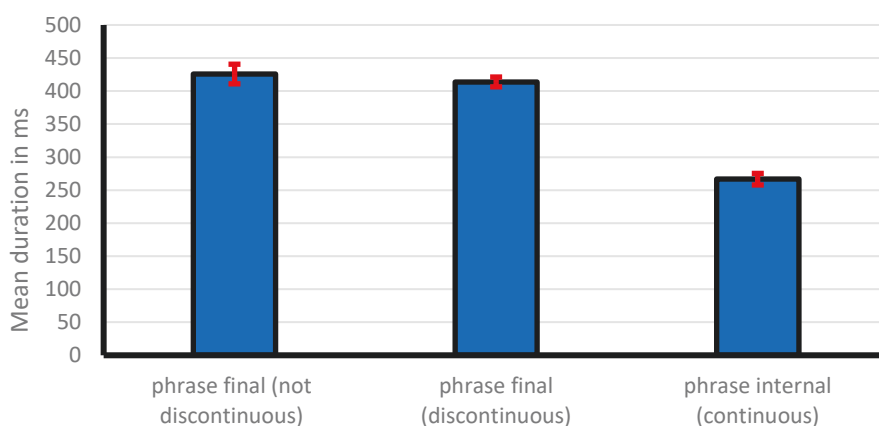


Figure 5.21 Mean duration of classifier *con*

5.4.4.3 Intonation

It turned out that the rising tone (*sắ́c*) has a clear influence on the following tone. As described above tones occurring before classifiers contained either the rising tone (*sắ́c*) or the level tone (*ngang*). In this section, I will show the behaviour of the classifiers *con*, *tráí* and *đàn* in phrase-final (discontinuous) and phrase-internal (continuous) position. The target sentences are shown below; the target classifier is printed in **bold** when it occurs after the level tone (*ngang*) and in **bold/italic when it occurred after the rising tone (*sắ́c*). The F0 of the classifier is shown first in phrase-final position (discontinuous noun phrase) and second in phrase-internal position (continuous noun phrase).²⁶**

²⁶ I was not aware of the large influence of the rising tone (*sắ́c*) on the following tone when the experiment was designed. Therefore, the target sentences were not specifically constructed to analyse the influence of rising tone (*sắ́c*) on the following word to the exclusion of other possible influences, such as the exact position of the numeral-classifier complex in the sentence. Thus, some target sentences may contain the target classifier before level tone (*ngang*) and before rising tone (*sắ́c*) at different positions in the enumeration within one target sentence. In other cases, the target classifier occurs after either level tone (*ngang*) or rising tone (*sắ́c*) within all parts of the enumeration.

1. Classifier *con* (level tone)

The following examples, (26) through (29), show the target sentences whose classifiers were analysed prosodically. (26) and (27) are target sentences in the discontinuous context where the classifier is in phrase-final position.

(26) Chó muốn nuôi ba **con**, còn thỏ thì hai con.
 dog want to raise three CLF and rabbit TOP two CLF
 ‘S/he wants to raise three dogs and two rabbits.’

(27) Voi muốn nuôi sáu **con**, ngựa bốn con, còn gà thì ba
 elephant want to raise six CLF horse four CLF and chicken TOP three
 con.
 CLF
 ‘S/he wants to raise six elephants, four horses and three chickens.’

Examples (28) and (29) are target sentences in the continuous context where the classifier occurs prosodic phrase-internally.

(28) Một em bé muốn nuôi ba **con** chó và hai **con** thỏ
 one small child want to raise three CLF dog and two CLF rabbit
 ‘A small child wants to raise three dogs and two rabbits.’

(29) Một em bé muốn nuôi sáu **con** voi, bốn **con** ngựa và ba
 one small child want to raise six CLF elephant four CLF horse and three
con gà.
 CLF chicken
 ‘A small child wants to raise six elephants, four horses and three chicken.’

The following graphs show the acoustic analysis of the classifier *con* (level tone) in different contexts:

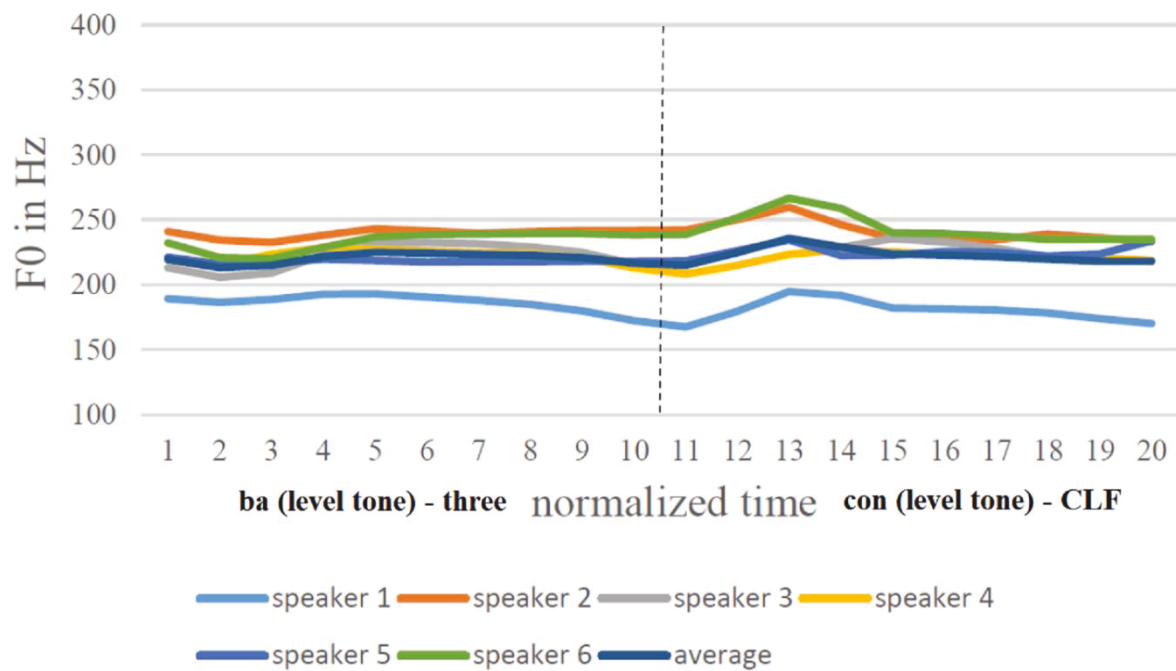


Figure 5.22 *Ba con* (three CLF), classifier in phrase final context, after level tone

Figure 5.22 shows the F0 contour of the classifier *con* after the numeral *ba* (three - level tone (*ngang*)) in phrase-final position; see (26). We see that the classifier *con* has mainly flat intonation, however some speakers display a small F0 fall at normalized time 11.

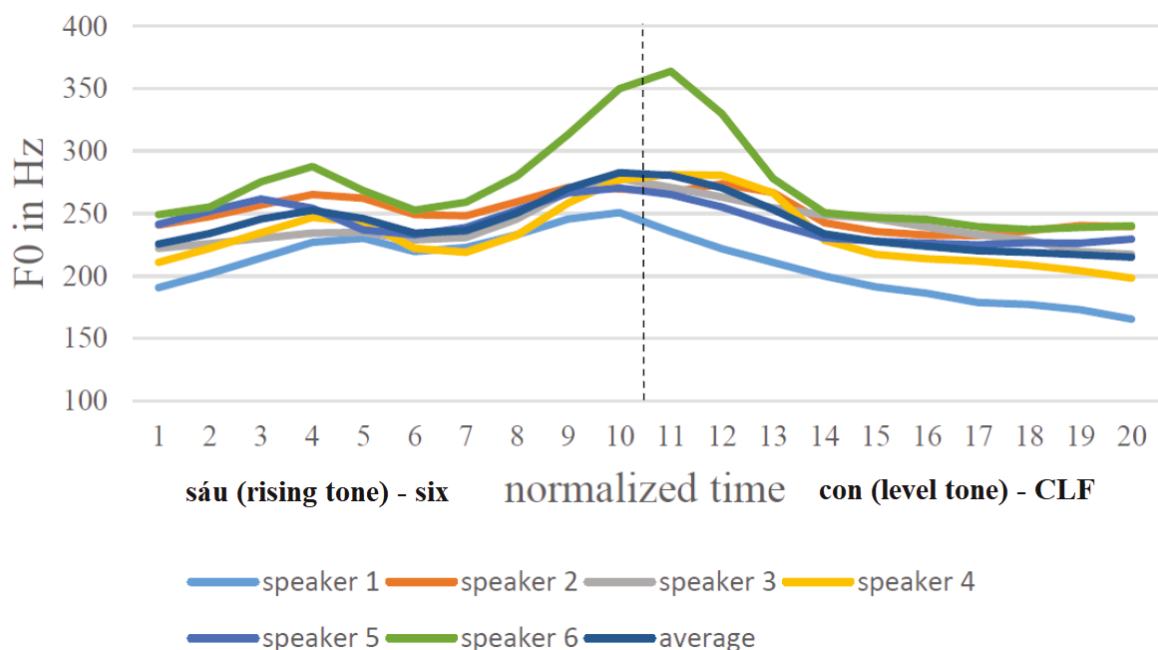


Figure 5.23 *Sáu con* (six CLF), classifier in phrase final position after rising tone

In Figure 5.23, the F0 contour of the classifier *con* after *sáu* (six - the rising tone (*sác*)) in phrase-final context is shown; see (27). Compared to Figure 5.22 all speakers start the classifier *con* with a higher F0, which then falls afterwards. The F0 of all the speakers falls between the

normalized time 10 and 13. However, the extent of the fall as well as the general intonation height differ. While speaker 6 has an F0 of about 364 Hz at normalized time 11, speaker 1 only has an F0 of 235 Hz at this point in time. Whereas the intonation of the classifier *con* by speaker 1 and speaker 3 falls rather consistently, the intonation contours of speakers 4 and 5 falls consistently until normalized time 14 and are rather level afterwards.

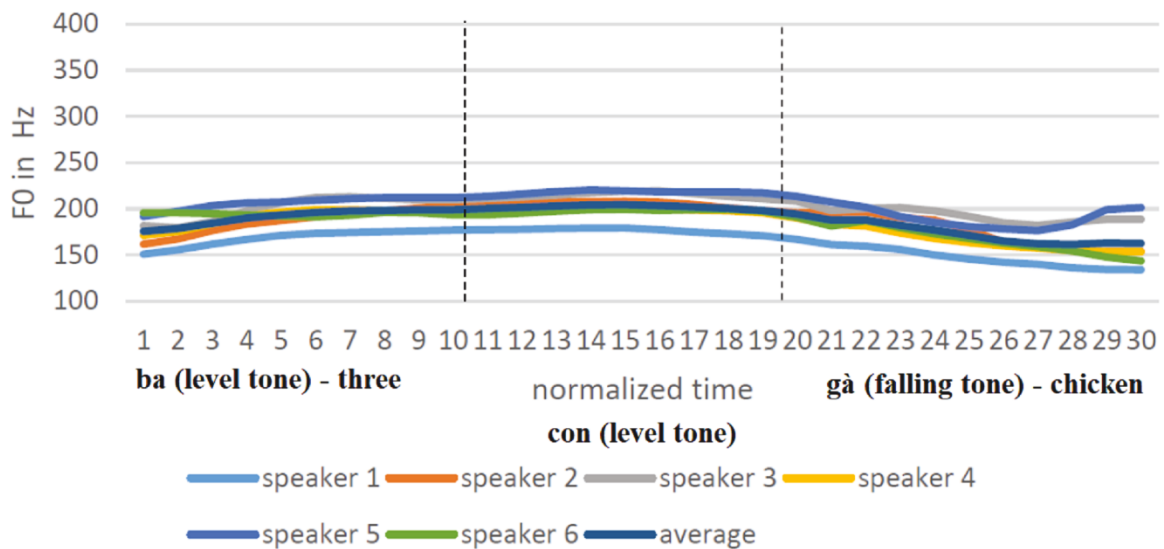


Figure 5.24 *Ba con gà* (three CLF chicken), classifier in phrase internal position, after level tone

Figure 5.24 shows the F0 of *con* after the numeral *ba* ('three' - level tone (*ngang*)) in phrase-internal position; see (28). The F0 of the classifier *con* is mainly level. However, all speakers start lowering their F0 contours at normalized time 18, which is a coarticulation effect of the following falling tone, where all speakers lower their F0. Still speaker 1 and speaker 3 raise their F0 again at normalized time 27 until 30.

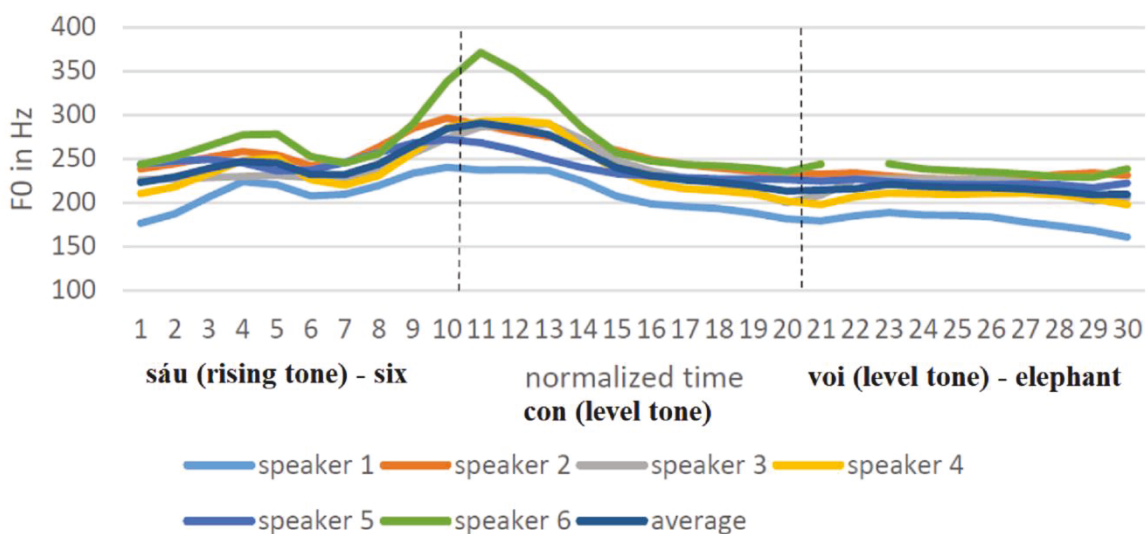


Figure 5.25 *Sáu con voi* (six CLF elephant), classifier in phrase internal position after rising tone

Figure 5.25 shows the classifier *con* in phrase-internal position; see (29). Before the classifier the numeral *sáu* (six – rising tone (*sắ́c*)) occurs and after *con* the noun *voi* ‘elephant’. Due to the influence of the rising tone (*sắ́c*), *con* also begins rather high (between about 237 and 371 Hz). Afterwards speakers 1, 3 and 4 maintain high F0 values until about normalized time 13/14 and then they fall. Speaker 2 and speaker 5 start to lower their F0 contours at about normalized time 10. Speaker 6 rises very high until 371 Hz. Afterwards her intonation falls directly. Her F0 is relatively level when the word *voi* ‘elephant’ is uttered.

The following diagram gives an overview of the analysis shown above, while comparing the average duration of the classifier *con* in phrase-internal and phrase-final condition:

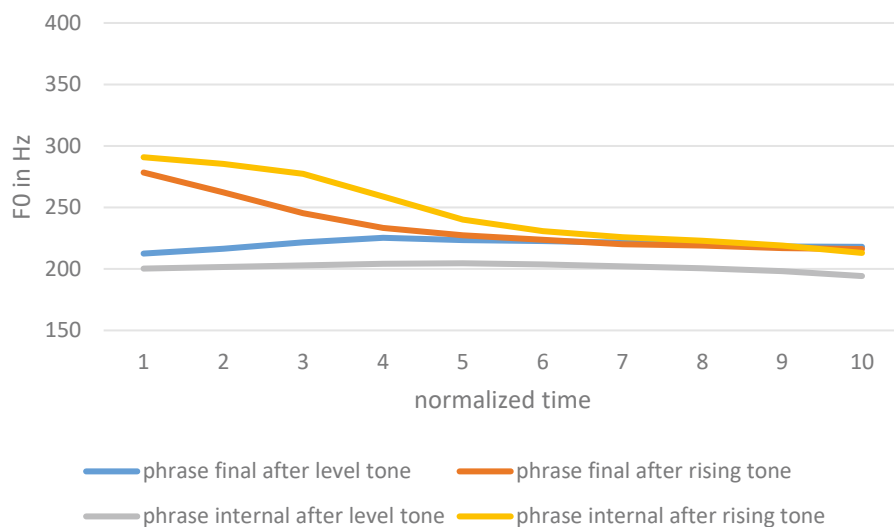


Figure 5.26 Average F0 of *con* (level tone) in different contexts

Figure 5.26 shows that in order to predict the general contour of the F0 of the classifier *con*, the preceding tone is more influential than the different phrasing conditions: when *con* follows the rising tone (*sắ́c*) it has a falling contour and when it follows the level tone (*ngang*) its contour is rather flat.

2. Classifier *trái* (rising tone)

The following target sentence (30) contains a discontinuous noun phrase where the classifier is in phrase-final condition:

- (30) Lựu mua ba **trái**, còn xoài thì sáu **trái**.
 pomegranate buy three CLF and mango TOP six CLF
 ‘I buy three pomegranates and six mangos.’

Example (31) is a target sentence in the continuous (phrase-internal) context.

- (31) Tôi mua sáu **trái** xoài và ba **trái** lựu.
 I buy six CLF mango and three CLF pomegranate
 ‘I buy six mangos and three pomegranates.’

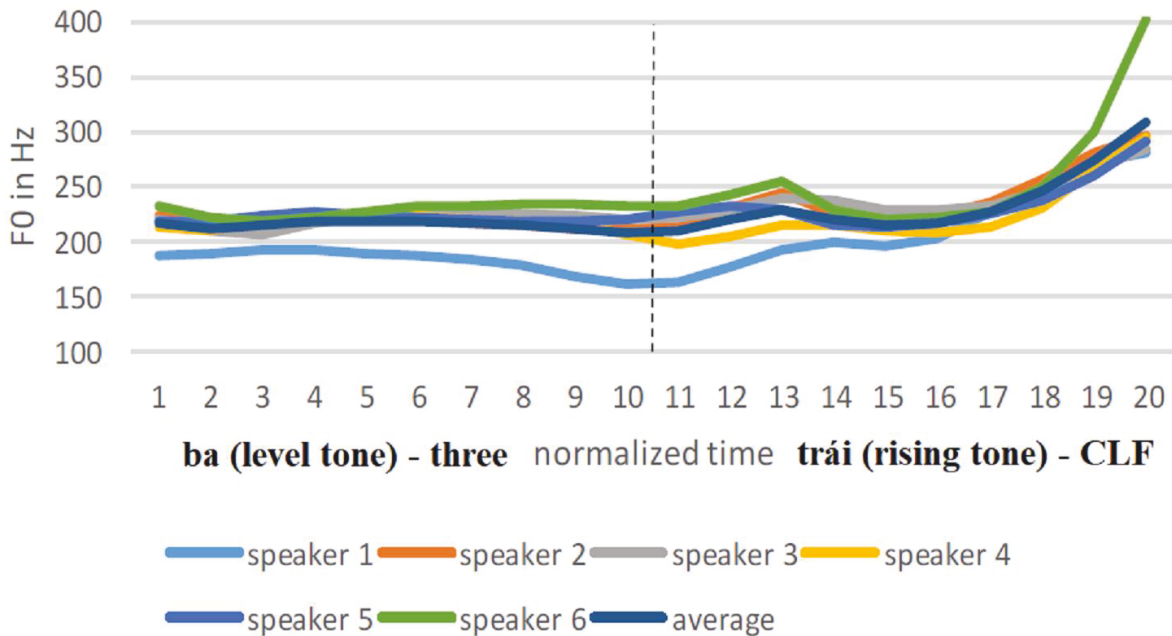


Figure 5.27 *Ba trái* (three CLF), classifier in phrase final context after level tone

Figure 5.27 shows the classifier *trái* (rising tone) in phrase-internal position after a level tone; see (30). It can be seen that most of the speakers display a relatively flat intonation and then start raising it from about point 14 of the normalized time. However, speaker 1 and speaker 4 start raising their F0 contours earlier, namely at normalized time 11. Furthermore, speaker 1 starts with an F0 lowering until about normalized time 10 and raises it afterwards. This speaker also displays a relatively low F0 contour altogether. Looking at the graph, it is obvious that speaker 6 raises her voice much higher than the other speakers. While speakers 1 through 5 only achieve F0 between about 270 and 280 Hz at the highest points in their intonation (mostly normalized time 20, for speaker 1 normalized time 19), speaker 6 gets as high as about 360 Hz.

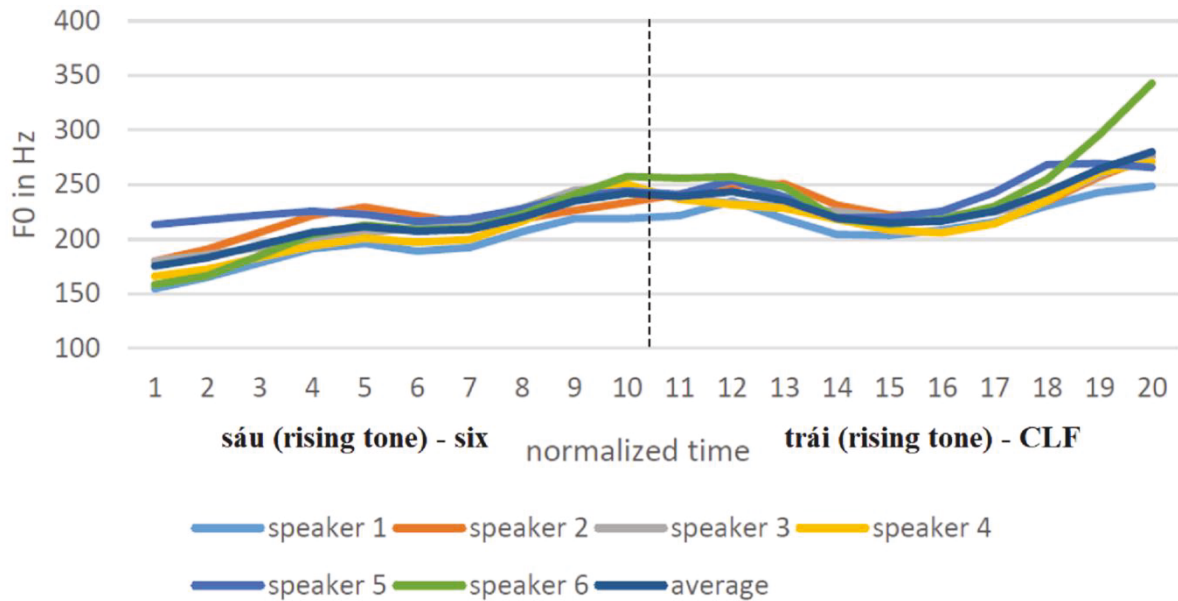


Figure 5.28 *sáu trái* 'six CLF', classifier in phrase final position after rising tone

Figure 5.28 shows *sáu trái* 'six CLF' (both words have the rising tone) in phrase-final context, see (30). It can be seen that with both words' F0 rises clearly. However, in the middle of each word, each speaker's F0 falls slightly and then rises again (in the first word at about normalized time 6 to 7, and in the second word at about normalized time 14 to 16).

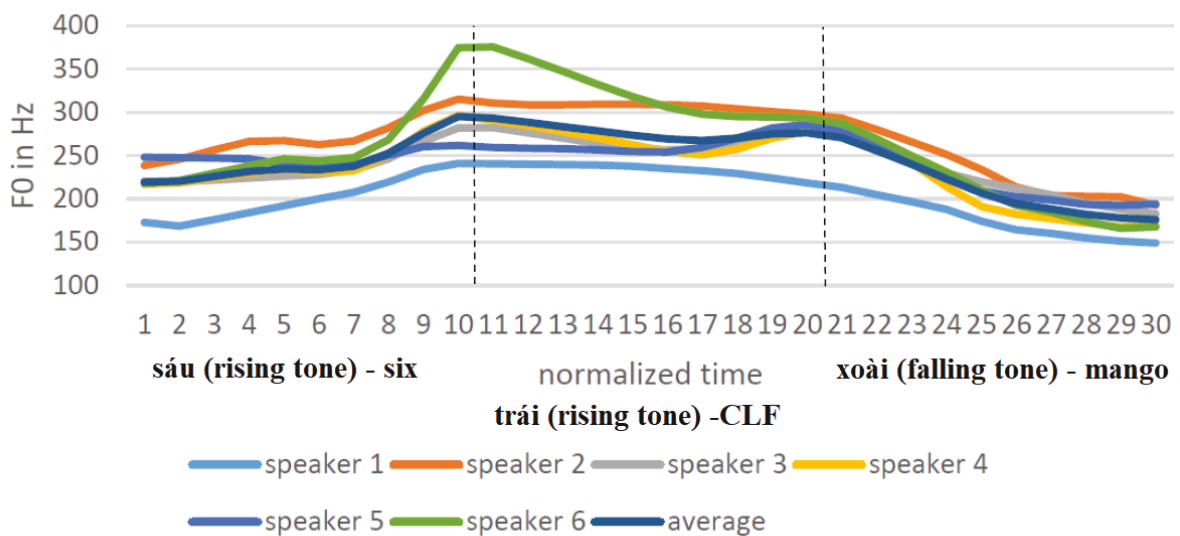


Figure 5.29 *Sáu trái xoài* (six CLF mango) classifier in phrase internal position after rising tone

Figure 5.29 shows the classifier *trái* (rising tone) in phrase-internal position; see (31). Before the classifier, we find the numeral *sáu* 'six' (rising tone), while after the classifier the noun *xoài* 'mango' (falling tone) occurs. The speaker's F0 rises clearly for *sáu* 'six' (until normalized time 10). However, for the classifier *trái* it clearly falls until at least normalized time 16. At this point speaker 3 and speaker 5 start raising their F0 again until normalized time 20. Speaker 4 raises her F0 from normalized time 17 until normalized time 20. The other speakers continue

lowering their F0 from normalized time 16 to 20, which is rather unexpected since these speakers do not raise their F0 at all although classifier *trái* carries the rising tone (*sắc*). For the noun *xoài* ‘mango’ (falling tone) all speakers lower their F0 as expected. Generally, speaker 6 and speaker 1 display the most extreme F0 curves. Speaker 6’s highest F0 (normalized time 11) is as high as about 376 Hz whereas speaker 1’s highest F0 is only about 241 Hz (normalized time 11).

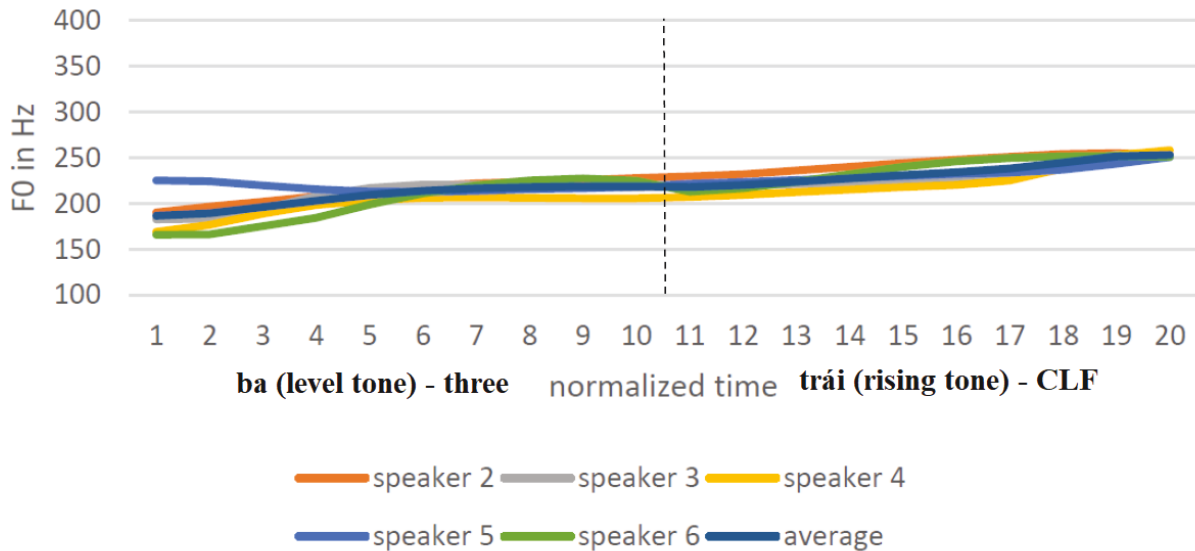


Figure 5.30 *ba trái* (three CLF) in phrase internal position after level tone

Figure 5.30 shows the classifier *trái* ‘CLF’ in phrase-internal position; see (31). The classifier is preceded by the numeral *ba* ‘three’ (level tone) and is followed by the noun *lựu* ‘pomegranate’ (dropping tone). Since *lựu* was produced with glottalization by most of the speakers, the F0 contour was not depicted correctly; therefore, this noun was not included in the diagram. Furthermore, speaker 1 was excluded since this speaker’s F0 contained an unrealistic contour. Generally, all speakers show a rather level intonation including a small rise. However, speaker 5 displays a slightly falling intonation until normalized time 5.

In the following diagram, we see a comparison between the average F0 in continuous and discontinuous noun phrases:

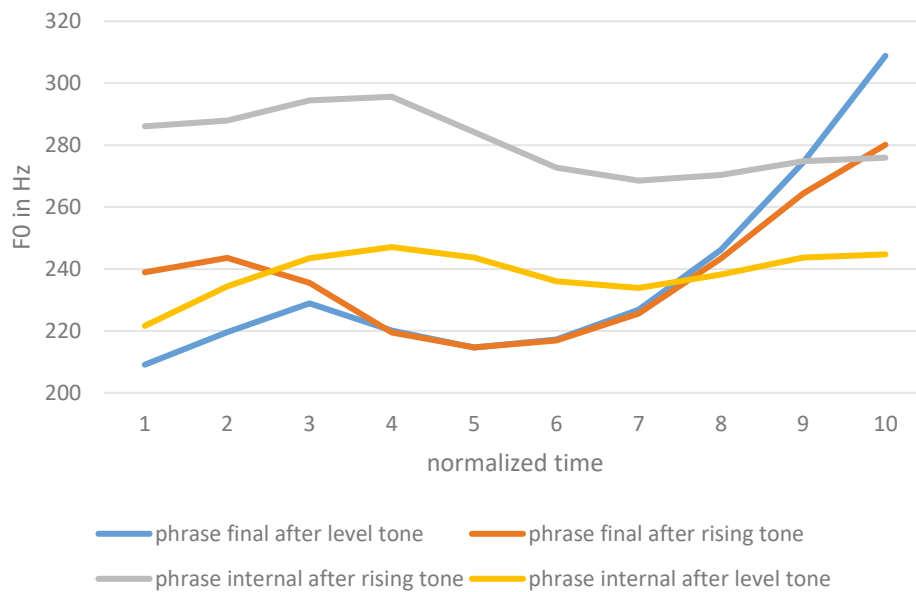


Figure 5.31 Comparison of the average F0 of *trái* (rising tone) in phrase final and phrase internal contexts

Figure 5.31 shows that the general intonation contour is comparable across the two conditions of the classifier *trái* (rising tone). For the phrase-final contexts, after both the level and the falling tone, there is a small fall, which reaches its lowest point at about point 5 of the normalized time, afterwards rising to its highest point at point 10 of the normalized time. For the phrase-internal positions, both after the level and rising tone, the contour is mainly level. It rises slightly at the beginning and then displays a small fall at about point 4 of the normalized time. However, in the phrase-internal position after the rising tone (*sắc*), the F0 contour begins much higher than after the level tone (*ngang*). This is an effect of progressive articulation. Generally, with the classifier *trái* (rising tone), the different phrasing conditions (phrase-final and phrase-internal) were more influential than the preceding tone in predicting the general contour of *trái* (rising tone). In phrase-final condition, the F0 contour was clearly rising whereas in phrase-internal context it was rather level. This is different from the classifier with the level and the falling tone. For these classifiers the preceding tone was more influential.

In order to find out whether there is a significant difference in slope between the phrase-final and phrase-internal positions, I performed statistical analyses. Since the first part of the contours was strongly influenced by the preceding tone, I only analysed the second part of the target word (normalized time 6 to 10).²⁷ For every speaker, I subtracted the F0 value at normalized time 10 from the value at normalized time 6. The results of the calculation are shown in Figure

²⁷ Thanks to Francesco Cangemi for commenting on this point.

5.32.²⁸ It can be seen that the F0 rose clearly in phrase-final position independently of speaker variation. For speaker 6 it rose much higher than for the other speakers. When it comes to phrase-internal positions, speakers 1, 2 and 6 produced falling intonation contours, whereas the other speakers' F0 contours were slightly rising.

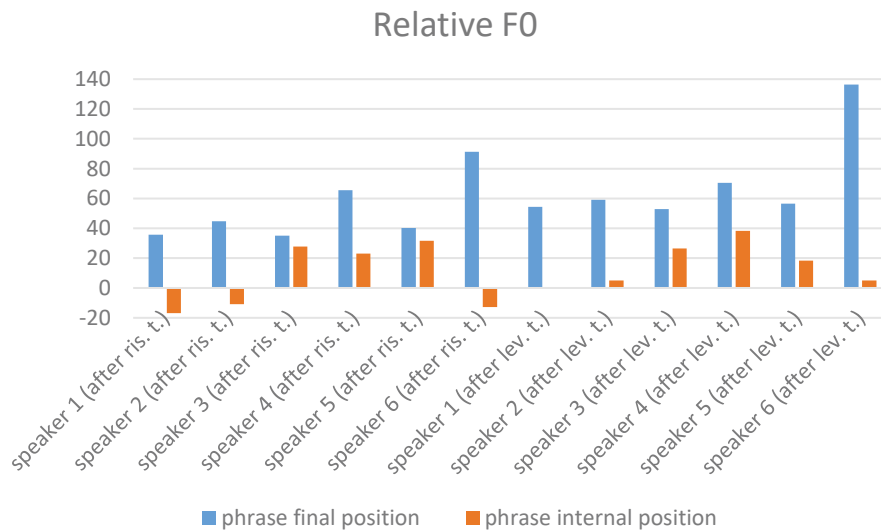


Figure 5.32 Relative F0

A t-test assuming unequal variance (due to the one missing value) was conducted to compare the relative increase/decrease in the phrase-final and phrase-internal contexts. The t-test showed that there was a very significant difference between the two categories ($p < 0.001$).

3. Classifier *đàn* (falling tone)

(32) shows a target sentence in the phrase-final context.

(32) Trâu có chín **đàn**, thỏ năm **đàn**, còn cừu
 buffalo have nine CLF (herd) rabbit five CLF (herd) and sheep
 thì ba **đàn**.
 TOP three CLF (herd)

‘There are nine herds of buffaloes, five herds of rabbits and three herds of sheep.’

In (33), a target sentences in the phrase-internal context is shown:

²⁸ “After ris. t.” means that the tone preceding the classifier (numeral) is rising, and “after lev. t.” is the condition of a level preceding tone. Note that as already shown in Figure 5.30, speaker 1’s F0 had to be excluded in the phrase-internal context after the level tone.

(33) Làng này có năm **đàn** thỏ ba đàn cừu và chín
 village this have five CLF (herd) rabbit three herd sheep and nine
đàn trâu.

CLF (herd) buffalo

‘This village has five herds of rabbits, three herds of sheep and nine herds of buffalos.’

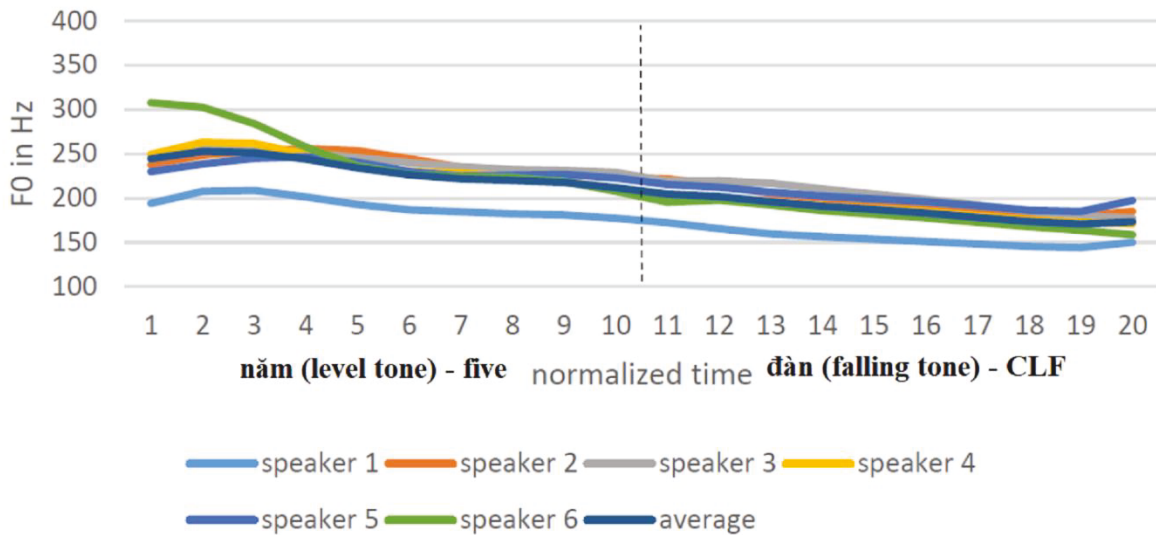


Figure 5.33 năm đàn (five CLF), classifier in phrase final position after level tone

Figure 5.33 shows the F0 contour of *năm đàn* ‘five CLF’ in phrase-final position; see target sentence (32). It is shown that the F0 of all the speakers generally falls. The fact that *năm* (level tone) – ‘five’ is falling although it has a lexical level tone seems to be due to progressive tonal coarticulation.

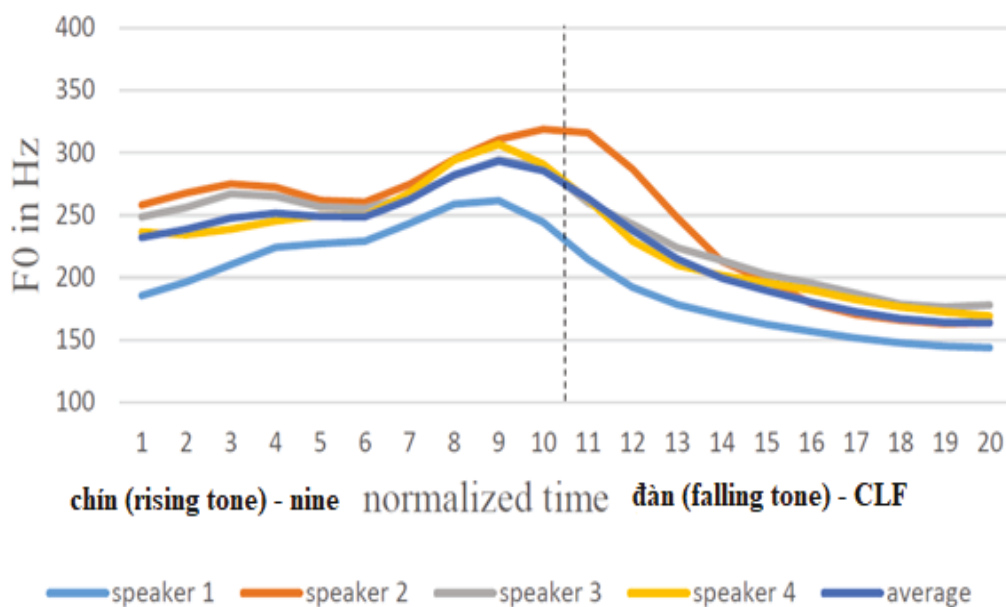


Figure 5.34 chín đàn (nine CLF), classifier in phrase final position after rising tone

Figure 5.34 shows speakers' F0 contours of *chín đản* 'nine CLF' when the classifier is in phrase-final position; see target sentence (32). In this case, both the numeral *chín* 'nine' (rising tone) and the classifier *đản* (falling tone) behave in accordance with their lexical tones, namely the first word displays rising intonation and the second word displays falling intonation. However, we can see that speakers 1, 3 and 4 start lowering their intonation at normalized time 10, which is slightly earlier than expected since the falling tone word *đản* only begins at normalized time 11. Thus, speaker 1, 3 and 4 display a small amount of tonal coarticulation. Speaker 2 does not show this effect, but starts lowering her F0 at normalized time 11. Note that speaker 5 and 6 were excluded due to unrealistic F0 contours.

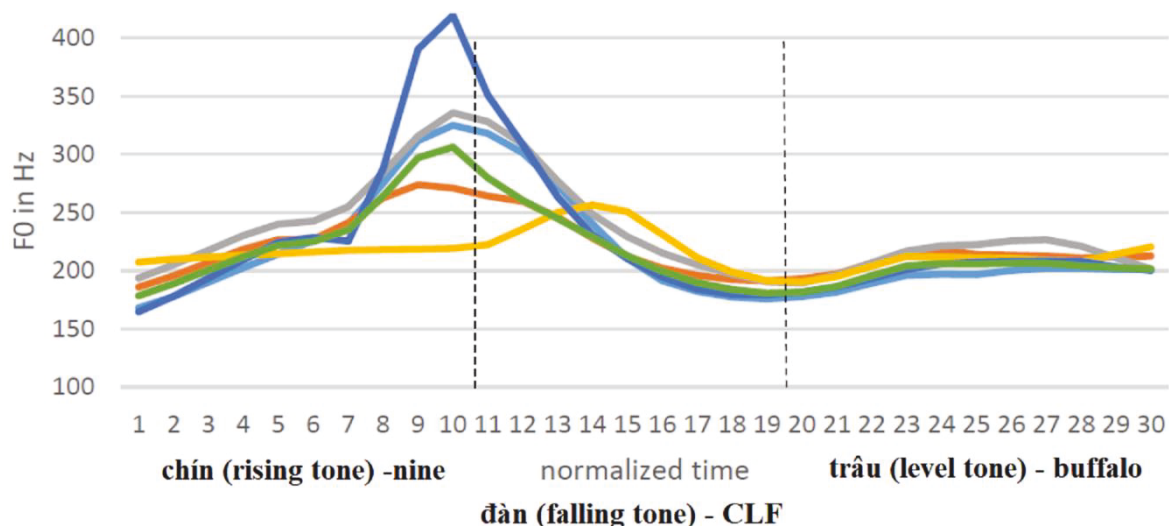


Figure 5.35 *chín đản trâu* (nine CLF buffalo), classifier in phrase internal position after rising tone

Figure 5.35 shows *chín đản trâu* (nine CLF buffalo) in phrase-internal position; see (33). It can be seen that generally speakers' F0 contours change according to their lexical tones. Most speakers rise for *chín* (rising tone), have a falling intonation for *đản* (falling tone) and show level intonation for *trâu* (level tone). However, speaker 5 falls at normalized time 11 like the other speakers, but then (unlike the other speakers) rises again until normalized time 14. Following this time point, the speaker's behaviour becomes similar to that of the other speakers in displaying falling and, for the last word, level intonation. Note that speaker 1 had to be excluded.

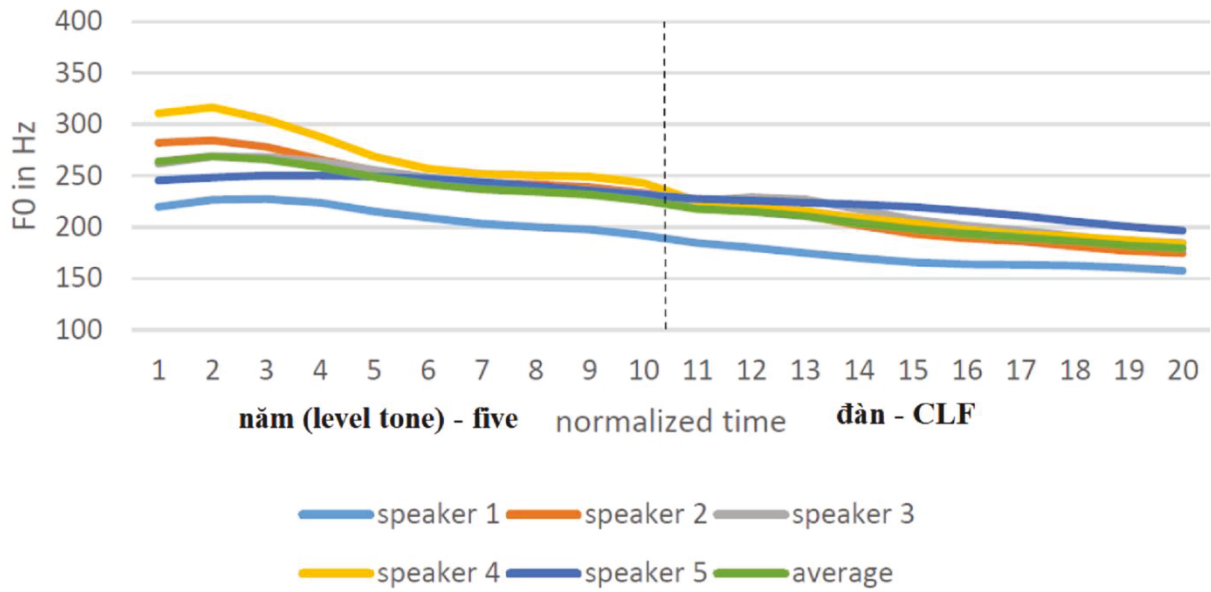


Figure 5.36 năm đàn (five CLF), classifier in phrase internal position after level tone

Figure 5.36 shows *năm đàn* (five CLF) where the classifier occurs phrase-internally. This sequence is taken from *năm đàn thỏ* (five CLF rabbit) ‘five herds of rabbits’; see (33). However, due to the glottalization of *thỏ* ‘rabbit’ by most speakers, the F0 contour could not be shown correctly. Therefore, the F0 of *thỏ* ‘rabbit’ is not depicted below. Generally, the F0 of all speakers shows falling intonation with both words. Again *năm* (level tone) ‘five’ displays progressive tonal coarticulation since its lexical tone is level. Comparing all the figures of the classifier *đàn*, it seems that there is more progressive tonal coarticulation with a level tone word (*năm* ‘five’) before *đàn* than with a rising tone word (*chín* ‘nine’) preceding it. Note that speaker 6 had to be excluded.

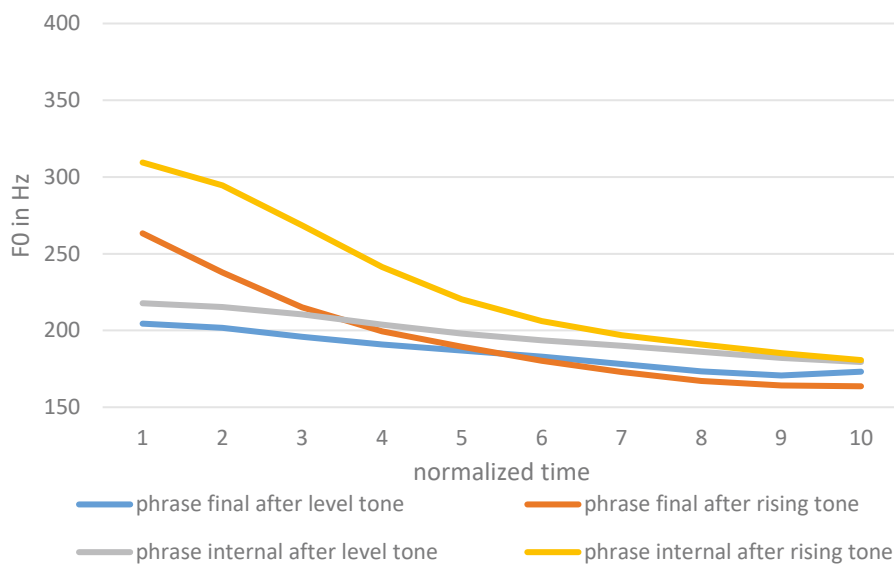


Figure 5.37 Average F0 of đàn (CLF – falling tone) in different contexts

Figure 5.37 shows the speakers' average F0 contours of the classifier *đàn* (falling tone). Generally, all average contours show falling intonation, which is expected since the lexical tone is the falling tone (*huyền*). Thus, there does not seem to be any special F0 variation comparing phrase-final to phrase-internal position. However, it can be seen that the average F0 falls from a much higher point when the preceding tone is a rising tone. In phrase-internal position the average F0 after the rising tone is 309 Hz at normalized time 1 and in phrase-final position after the rising tone the average F0 is 263 Hz at the same time point. However, after the level tone the average F0 is much lower at normalized time 1: In phrase-internal position, it is 218 Hz and in phrase-final position it is 205 Hz.

5.5 Conclusion first and second experiments

The classifier *cái* (rising tone) and the noun *ghế* (rising tone) 'chair' of the first experiment have a longer duration, as well as with the classifiers *con* (level tone), *trái* (rising tone), *đàn* (falling tone), *củ* (curve tone) and *ngọn* (drop tone) of the second experiment at the end of a phonological phrase. This is analysed as a final lengthening effect (see for instance Liberman & Pierrehumbert (1984) for this effect in English). Final lengthening is independent of the lexical tone.

The classifier does not show final lengthening effects when it is followed by a modifying adjective in a discontinuous setting, since in this case, the phonological phrase only ends after the adjective. Consequently, we find a phrase boundary after one item of an enumeration or at the end of a discontinuous NP. Thus, the hypothesized prosodic phrase boundaries (see Section 5.2, as well as the repeated prosodic structures in examples (34) to (37)) can be confirmed.

As for now, there is no evidence that the intonational phrase plays a role in the formation of discontinuous noun phrases in Vietnamese other than wrapping of the whole sentence. Therefore, discontinuous noun phrases in Vietnamese are rather cohesive: A sentence containing a discontinuous noun phrase forms a single intonational phrase. However, more research needs to be done on the intonational phrase in Vietnamese to better know its function. It is not clear whether it may have other functions than wrapping up a sentence.

-Sentence type 1: Sentences containing continuous noun phrases

- (34) ...(*bốn cái ghế*)_ϕ (ba cái *rổ*)_ϕ (và sáu cái *gương*)_ϕ
 ...(*four CLF chair*)_ϕ (*three CLF basket*)_ϕ (*and six CLF mirror*)_ϕ

-Sentence type 2: Sentences containing discontinuous noun phrases

- (35) (Ghế thì bán bốn cái)_φ, (rổ thì bán sáu cái)_φ (và gương thì bán ba cái)_φ
 (chair TOP sell four CLF)_φ (basket TOP sell six CLF)_φ (and mirror TOP
 bán ba cái)_φ
 sell three CLF)_φ

-Sentence type 3: Sentences containing continuous noun phrases where the classifier functions as a pronoun:

- (36) (Thảo thì mua bốn cái)_φ (Lý thì mua ba cái)_φ (và Mai thì mua sáu cái)_φ
 (Thao TOP buy four CLF)_φ (Ly TOP buy three CLF)_φ (and Mai TOP
 mua sáu cái)_φ
 buy six CLF)_φ

-Sentence type 4: Sentences containing discontinuous noun phrases with an adjective after the classifier (prosodic phrases move further to the right)

- (37) (Bàn thì bán hai cái đỏ)_φ (và ba cái vàng)_φ (gương thì bán bốn cái vàng)_φ (và hai cái xanh)_φ (và ghế thì bán ba cái vàng)_φ (và chín cái đỏ)_φ
 (table TOP sell two CLF red)_φ (and three CLF yellow)_φ (mirror TOP
 bán bốn cái vàng)_φ (và hai cái xanh)_φ (và ghế thì bán
 sell four CLF yellow)_φ (and two CLF green/blue)_φ (and chair TOP sell
 ba cái vàng)_φ (và chín cái đỏ)_φ
 three CLF yellow)_φ (and nine CLF red)_φ

My research shows that in the case of the rising tone (*sắc*), the correlates of a phonological phrase boundary are clear articulation of the tone (clearly rising, not only slightly rising, generally level or falling as in other contexts) and longer duration. The studies confirm that the pitch range is wider in phrase-final tone position for the rising tone (*sắc*) compared to phrase-internal position and that this effect occurs together with longer duration, as in Brunelle (2016) (see Section 4.3.2). However, Brunelle (2016) did not show that the rising tone may lose its rising structure completely by being falling or level. In the second experiment, the classifiers *con* (level tone) and *đàn* (falling tone) were also evaluated; with these tones no special intonation effect was found when comparing phrase-final to phrase-internal position.

Vietnamese tones are rather flexible with regard to word order change compared to other tone languages, as for example Cantonese (Ding & Féry 2014). This means that in Vietnamese parts of a tone's F0 contour may get lost due to intonation effects. In Cantonese, this would not be the case. The lexical tone would be consistent in all contexts. Finally, intonation effects are not

only present with regard to sentence modality and function words as in Đỗ et al. (1998) and Hà & Grice (2010), but are also present when it comes to nominal modification.

More generally, the study shows that Vietnamese may express information structure with the help of intonation (as formulated in Jannedy 2007, 2008), since discontinuous noun phrases occur in a special information-structural setting (contrastive topic and focus).

Sentences containing continuous noun phrases where the classifier functions as a pronoun (sentence type 3) behaved like regular discontinuous noun phrases, since they have the same prosodic structure. Considering these similarities, the question arises whether discontinuous NPs are really discontinuous in the sense that they are two parts of a single NP or whether only the first part is a noun and the second part constitutes a pronoun. The latter possibility is more convincing, especially considering the syntactic findings. If discontinuous noun phrases are base-generated, there is no reason to assume that there is any difference between them and comparable constructions with the classifier as a pronoun besides regular discontinuity.

The two studies did not show any difference when comparing the Northern to the Southern dialect. However, the studies were not exactly the same, therefore more research is needed to confirm this assumption. In the first study, only a rising tone classifier was analysed and no Praat (Boersma & Weenink 2018) script (like *Prosody Pro* by Xu 2013) was used to analyse the F0 with a normalized time. In the second study, only classifiers were analysed in detail and no nouns, whereas the first study also analysed the noun *ghé* (rising tone) ‘chair’. This leaves many possibilities for further research.

Chapter 6 Conclusion and summary

The topic of this book is an investigation of the syntactic and prosodic properties of discontinuous noun phrases in Vietnamese. It is the first work that analyses this phenomenon in detail.

Discontinuous noun phrases constitute a special type of non-canonical word order, defined in the following way: “Discontinuous noun phrases occur when a noun phrase’s head is separated from its other constituents or when two base-generated noun phrases share the same Θ -role” (modified definition from Fanselow & Féry (2006 and in prep.)).

In Vietnamese, discontinuous noun phrases occur in a special information-structural setting namely in (contrastive) topic and focus. Other information structural settings are not possible. This is interesting from a typological point of view. Mandarin Chinese is another isolating tone language that allows discontinuous noun phrases. Still, in this language discontinuous noun phrases occur in more information structural settings.

Vietnamese possesses inverted splits. As special kinds of discontinuous noun phrases, Vietnamese has gapless splits (splits containing two full NPs) and mixed splits (splits where a whole VP is fronted).

Classifiers play an important role in the discussion of discontinuous noun phrases since they are often involved in them. It is necessary to consider a noun’s properties with regard to classifiers in order to correctly predict the structure of NP split constructions in Vietnamese. The distinction between relational/non-relational nouns as proposed by Trinh (2011) is not relevant.

Classifiers constitute an open lexical class in Vietnamese. The main types of classifiers in Vietnamese are numeral-classifiers (classifiers that make a noun countable) and noun classifiers (classifiers that categorize the noun). Other classifier types are deictic and wh-word classifiers. In Vietnamese, classifiers also function as pronouns, without an overt head noun in the same sentence. Further research needs to be done to categorize Vietnamese classifiers in a clearer way and to better predict their syntactic and semantic behaviour.

Discontinuous noun phrases are derived by base-generation since the remnant may be stranded without a head noun in the same sentence and some discontinuous noun phrases do not have a continuous counterpart (gapless split and some compound constructions). Trinh's (2011) argumentation for a movement analysis is not convincing because his island constraints do not hold. The base-generation analysis for discontinuous noun phrases is in accordance with the general observation that in Vietnamese, a *wh-in-situ* language, movement does not occur frequently.

The two base-generated parts of a discontinuous noun phrase are connected to each other in that they share the same θ -roles. Furthermore, the noun is an open expression whereas the remnant constitutes a closed one. However, more research needs to be done to show the connection between noun and remnant more precisely, not just for Vietnamese, but also for other languages in which discontinuous noun phrases are derived by base-generation.

In this book, I proposed a prosodic hierarchy for Vietnamese that contained the prosodic word. This view is in accordance with A. H. Phạm (2008), but contrary to Schiering et al. (2010). My argumentation relies on the prosodic behaviour of reduplications and loan words. The different studies on the prosodic hierarchy and intonation in Vietnamese generally show that Vietnamese displays intonation effects and that lexical tones may vary. However, while some studies only find very small effects, for others they are rather obvious. Ingram & Nguyễn (2006), for example, showed that phrases and compounds are only distinguished under conditions of maximal contrast by the use of pauses. Thus, the effects the authors found are rather small. However, in Hà & Grice (2010) function words that have a lexical falling tone may be articulated as rising when information is requested or when they are used as a turn exit technique.

More research is needed to analyse the different levels of the prosodic structure in Vietnamese in more depth. Additionally, more needs to be investigated about how lexical tones vary in which intonational situations.

Two prosodic studies on discontinuous noun phrases in Vietnamese were presented. The first experiment was about the Northern dialect and the second experiment was on the Southern dialect. It turned out that in both dialects final lengthening effects are found at the prosodic phrase boundary. Furthermore, the rising tone is clearly articulated as rising in phrase-final position whereas it is level or even falling in phrase-internal position. These findings are

interesting from a typological perspective because not all tone languages show intonation effects. However, in Vietnamese F0 may be used for intonational purposes although F0 is already occupied by lexical tone. Furthermore, the findings of the two studies contribute to the research on the prosodic structure in Vietnamese by showing correlates of the prosodic phrase. As was shown in the discussion on syntax, discontinuous noun phrases in Vietnamese constitute two base-generated constituents; this is in accordance with the fact that they also form two separate prosodic phrases. More research needs to be done in order to better analyse the complex interaction between lexical tone, prosodic structure and intonation in Vietnamese.

Appendix – Target sentences

1. List of target sentences used in the first experiment

Sentences containing continuous noun phrases

- (1) Sáng nay anh Dũng bán bốn cái ghế, ba cái
this morning older brother Dung sell four CLF chair three CLF
rổ và sáu cái gương.
basket and six CLF mirror
'This morning Dung sells four chairs, three baskets and six mirrors.'
- (2) Sáng nay anh Dũng bán ba cái rổ, hai cái
this morning older brother Dung sell three CLF basket two CLF
gương và bốn cái ghế.
mirror and four CLF chair
'This morning Dung sells three baskets, two mirrors and four chairs.'
- (3) Sáng nay anh Dũng bán bốn cái gương, sáu cái
this morning older brother Dung sell four CLF mirror six CLF
ghế và ba cái rổ.
chair and three CLF basket
'This morning Dung sells four mirrors, six chairs and three baskets.'¹

¹ Note that for target sentences that occurred with different word orders, the numbers in the sentences were not identical. However, this does not seem to influence the outcome of the two experiments.

Sentences containing discontinuous noun phrases

- (4) Ghế thì bán bốn cái, rổ thì bán sáu cái và
chair TOP sell four CLF basket TOP sell six CLF and
gương thì bán ba cái
mirror TOP sell three CLF
'He sells four chairs, six baskets and three mirrors.'

- (5) Rổ thì bán bốn cái, gương thì bán hai cái và
basket TOP sell four CLF mirror TOP sell two CLF and
ghế thì bán ba cái.
chair TOP sell three CLF
'He sells four baskets, two mirrors and three chairs.'

- (6) Gương thì bán hai cái, ghế thì bán sáu cái và
mirror TOP sell two CLF chair TOP sell six CLF and
rổ thì bán bốn cái.
basket TOP sell four CLF
'He sells two mirrors, six chairs and four tables.'

Sentences containing continuous noun phrases where the classifier functions as a pronoun

- (7) Thảo thì mua bốn cái, Lý thì mua ba cái và Mai
Thao TOP buy four CLF Ly TOP buy three CLF and Mai
thì mua sáu cái.
TOP buy six CLF
'Thao buys four, Ly buys three and Mai buys six.'

- (8) Lý thì mua hai cái, Mai thì mua sáu cái và
Ly TOP buy two CLF Mai TOP buy six CLF and
Thảo thì mua ba cái.
Thao TOP buy three CLF
'Ly buys two, Mai buys six and Thao buys three.'

- (9) Mai thì mua sáu cái, Thảo thì mua hai cái và Lý
 Mai TOP buy six CLF Thao TOP buy two CLF and Ly
 thì mua bốn cái.
 TOP buy four CLF
 ‘Mai buys six, Thao buys two and Ly four.’

Sentences containing discontinuous noun phrases with an adjective after the classifier (prosodic phrases move further to the right)

- (10) Bàn thì bán hai cái đỏ và ba cái vàng, gương thì
 table TOP sell two CLF red and three CLF yellow mirror TOP
 bán bốn cái vàng và hai cái xanh và ghế thì
 sell four CLF yellow and two CLF green/blue and chair TOP
 bán ba cái vàng và chín cái đỏ.
 sell three CLF yellow and nine CLF red
 ‘He sells two red and three yellow tables, four yellow and two green/blue mirrors and three yellow and nine red chairs.’

2. List of target sentences used in second experiment

Sentences containing continuous noun phrases

(11) Một em bé muốn nuôi ba con chó và hai con
one child small want to raise three CLF dog and two CLF
thỏ.
rabbit

‘A small child wants to raise three dogs and two rabbits.’

(12) Một em bé muốn nuôi sáu con voi, bốn con
one small child want to raise six CLF elephant four CLF
ngựa và ba con gà.
horse and three CLF chicken

‘A small child wants to raise six elephants, four horses and three chicken.’

(13) Tôi mua sáu trái xoài và ba trái lựu.
I buy six CLF mango and three CLF pomegranate

‘I buy six mangos and three pomegranates.’

(14) Tôi mua sáu trái lê, bốn trái táo và hai trái
I buy six CLF pear four CLF apple and two CLF
ổi.
guava

‘I buy six pears, four apples and two guavas.’

(15) Chị Hương mua hai củ gừng và bốn củ .
older sister Huong buy two CLF ginger and four CLF
kiệu.

pickled scallion head

‘Huong buys two roots of ginger and four pickled scallion heads.’

(16) Chị Hương mua ba củ ấu, sáu củ tỏi và bốn củ khoai.
 older sister Huong buy three CLF caltrops six CLF garlic and four CLF sweet potato

‘Huong buys three caltrops, six garlic bulbs and four sweet potatoes.’

(17) Bé Minh đếm được hai ngọn núi và bốn ngọn cọ.
 small child Minh count can two CLF mountain and four CLF palm

‘Minh could count two mountains and four palms.’

(18) Bé Minh đếm được năm ngọn cờ, sáu ngọn cây và hai ngọn lửa.
 small child Minh count can five CLF flag six CLF tree and two CLF fire

‘Minh could count five flags, six trees and two fires.’

(19) Làng này có năm đàn thỏ, ba đàn cừu và chín đàn trâu.
 village this have five herd rabbit three herd sheep and nine herd buffalo

‘This village has five herds of rabbits, three herds of sheep and nine herds of buffaloes.’

Sentences containing discontinuous noun phrases (without added adjective)

(20) Chó muốn nuôi ba con, còn thỏ thì hai con.
 dog want to raise three CLF and rabbit TOP two CLF

‘S/he wants to raise three dogs and two rabbits.’

- (21) Voi muốn nuôi sáu con, ngựa bốn con, còn
 elephant want to raise six CLF horse four CLF and
 gà thì ba con.
 chicken TOP three CLF
 ‘S/he wants to raise six elephants, four horses and three chickens.’
- (22) Thỏ muốn nuôi hai con, còn chó thì ba con.
 rabbit want to raise two CLF and dog TOP three CLF
 ‘S/he wants to raise two rabbits and three dogs.’
- (23) Gà muốn nuôi ba con, voi sáu con, còn
 chicken want to raise three CLF elephant six CLF and
 ngựa thì bốn con.
 horse TOP four CLF
 ‘S/he wants to raise three chickens, six elephants and four horses.’
- (24) Xoài mua sáu trái, còn lựu thì ba trái.
 mango buy six CLF and pomegranate TOP three CLF
 ‘S/he buys six mangos and three pomegranates.’
- (25) Lựu mua ba trái, còn xoài thì sáu trái.
 pomegranate buy three CLF and mango TOP six CLF
 ‘I buy three pomegranates and six mangos.’
- (26) Lê mua sáu trái, táo bốn trái, còn ổi thì hai trái.
 pear buy six CLF apple four CLF and guava TOP two CLF
 ‘She buys six pears, four apples and two guavas.’
- (27) Ổi mua hai trái, lê sáu trái, còn táo thì bốn trái.
 guava buy two CLF pear six CLF and apple TOP four CLF
 ‘I buy two guavas, six pears and four apples.’

- (28) Trâu có chín đàn, thỏ năm đàn, còn
 buffalo have nine CLF rabbit five CLF and
 cừu thì ba đàn.
 sheep TOP three CLF
 ‘There are nine herds of buffalos, five herds of rabbits and three herds of sheep.’
- (29) Thỏ có năm đàn, cừu ba đàn còn trâu thì chín
 rabbit have five CLF sheep three CLF and buffalo TOP nine
 đàn.
 CLF
 ‘There are five herds of rabbits, three herds of sheep and nine herds of buffalos.’
- (30) Gừng mua hai củ, còn kiệu thì bốn củ.
 ginger buy two CLF and pickled scallion head TOP four CLF
 ‘He buys two bulbs of ginger, and four pickled scallion heads.’
- (31) Kiệu mua bốn củ, còn gừng thì hai củ.
 pickled scallion heads buy four CLF and ginger TOP two CLF
 ‘She buys four pickled scallion heads and two bulbs of ginger.’
- (32) Khoai mua bốn củ, ấu ba củ, còn tỏi
 sweet potato buy four CLF caltrop three CLF and garlic
 thì sáu củ.
 TOP six CLF
 ‘She buys four sweet potatoes, three caltrops and six bulbs of garlic.’
- (33) Ấu mua ba củ, tỏi sáu củ, còn khoai thì
 caltrop buy three CLF garlic six CLF and sweet potato TOP
 bốn củ.
 four CLF
 ‘She buys three caltrops, six bulbs of garlic and four sweet potatoes.’

(34) Núi đếm được hai ngọn còn cọ thì đếm được bốn
 mountain count can two CLF and palm TOP count can four
 ngọn.

CLF

‘S/he could count two mountains and four palms.’

(35) Cọ đếm được hai ngọn, còn núi thì bốn ngọn.
 palm count can two CLF and mountain TOP four CLF

‘S/he can count two palms and four mountains.’

(36) Cờ đếm được năm ngọn, cây sáu ngọn, còn lửa thì hai
 flag count can five CLF tree six CLF and fire TOP two
 ngọn

CLF

‘S/he can count five flags, six trees and two fires.’

(37) Lửa đếm được hai ngọn, cờ năm ngọn, còn cây thì sáu
 fire count can two CLF flag five CLF and tree TOP six
 ngọn.

CLF

‘S/he can count two (flames of) fire, five flags and six trees.’

Sentence containing continuous noun phrases where the classifier functions as a pronoun

(38) Tý muốn nuôi hai con, Thảo ba con, còn Hồng thì
 Ty want to raise two CLF Thao three CLF and Hong TOP
 chín con.

nine CLF

‘Ty wants to raise two, Thao three and Hong nine.’

Sentences containing discontinuous noun phrases with an added adjective after the classifier (prosodic phrases boundary moves further to the right)

- (39) Táo thì mua hai trái đỏ, sáu trái vàng, khế
 apple TOP buy two CLF red six CLF yellow carambola
 thì sáu trái nhỏ, ba trái to, còn cam thì bốn
 TOP six CLF small three CLF big and orange TOP four
 trái đỏ và chín trái vàng.
 CLF red and nine CLF yellow

‘She buys two red and six yellow apples, six small and three big carambolas, as well as four red and nine yellow oranges.’

- (40) Chó thì muốn nuôi hai con lớn và ba con
 dog TOP want to raise two CLF big and three CLF
 nhỏ, thỏ thì hai con nâu và ba con trắng,
 small rabbit TOP two CLF brown and three CLF white
 còn mèo thì sáu con đen và hai con xám.
 and cat TOP six CLF black and two CLF grey

‘He wants to raise two big and three small dogs, two brown and three white rabbits, and six black and two grey cats.’

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